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STOPPING WATER POLLUTION AT ITS SOURCE

MISA
Municipal/Industrial Strategy for Abatement

TWELVE-MONTH MONITORING DATA REPORT

INORGANIC CHEMICAL SECTOR

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MUNICIPAL-INDUSTRIAL STRATEGY FOR ABATEMENT (MISA)

TWELVE-MONTH MONITORING DATA REPORT INORGANIC CHEMICAL SECTOR

Periods covered: December 1, 1989 to November 30, 1990
February 1, 1990 to January 31, 1991

SEPTEMBER 1992

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Report prepared by:

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MISA Industrial Section
Water Resources Branch
Ontario Ministry of the Environment

SEPTEMBER 1992

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EXECUTIVE SUMMARY

As part of the Ontario Ministry of the Environment's Municipal-Industrial Strategy for Abatement (MISA) program, twenty-eight Inorganic Chemical Sector (ICS) plants were required by regulation to monitor their effluent streams for a twelve-month period.

The purpose of the monitoring phase of the MISA program was to generate a database on loadings of contaminants from direct dischargers and to provide data for the selection of parameters for technology-based limits under the MISA limits phase.

Twenty-two plants commenced monitoring on December 1, 1989 while the remaining six plants commenced their twelve-month monitoring period on February 1, 1990. This report presents in graphical and tabular form the results of monitoring effluent streams for all twenty-eight plants as required by Ontario Regulations 395/89 and its three amendments. Although intake water monitoring was not a regulatory requirement, intake water data was voluntarily provided by approximately two-thirds of the sites in the Sector.

Graphical plots of total plant flows and loadings for seven common conventional contaminants are presented in Appendix A. Total Sector loadings are also included for these contaminants. The twelve-month monitoring results for all "found" (see definition for "found" on page 8) parameters, including core conventional contaminants, are presented in the form of concentration/loading tables in Appendix B.

Storm water and waste disposal site effluent data are presented in Appendix C. There were no emergency overflow incidents reported during the monitoring period.

Summary comparison tables of Ministry inspection data and plant monitoring data, which are presented in Appendix D, show no major systematic differences between the two data sets indicating that the plant monitoring data is reliable for use in the limit setting process.

To support interpretation of the data, explanatory notes are included in Appendices B, C and D. Appendices E-1 to E-3 contain a summary of data remark code qualifiers, a summary of available Provincial Water Quality Objectives/Guidelines (PWQO/G) and background information on data confidence limits estimation. Comparisons of the monitoring data to the PWQO/G may impart some meaning to the data but does not imply necessary compliance.

A total of one hundred and thirty-eight Effluent Monitoring Priority Pollutant List (EMPPL) parameters were specified for monitoring in the regulation. Of this total, eighty-six were "found" in ICS effluents, of which forty-five are classified as persistent toxic compounds. Parameters designated as "found" included those for which only a maximum concentration value was determined because of analytical interference problems[1]. Individual site "found" parameter totals for process type (process, combined and batch effluents) streams ranged from sixty-four for the Allied Chemical facility (of

[1]Occurred for only 0.5% of the database

which forty-four were confirmed by the plant), to four for the Washington Mills and Liquid Carbonic (Courtright and Maitland) plants.

Of twenty-one compounds/groups listed on the Ministry's recently released Primary List of Candidate Substances for Bans or Phase-Outs, seven were "found" in ICS effluent streams.

Although chlorinated dibenzo-p-dioxins and dibenzofurans were "found" in effluent from eleven plants, the quantification is inconclusive for eight plants since the results are based on a small number of samples. Intake water results for two plants were at comparable levels to the effluent stream. The highly toxic 2,3,7,8 tetrachlorodibenzo-p-dioxin was not "found" in any of the effluent streams at mean concentration levels above RMDL.

Within the Sector, the larger dischargers of EMPPL compounds include Allied Chemical (which is being shutdown), General Chemical and ICI's Cornwall and Courtright facilities.[2] Larger dischargers of conventional contaminants in the Sector include Cyanamid Canada (Welland plant), General Chemical and ICI (Courtright).

For some facilities, parameters found in the effluent stream were also "found" in the intake stream at comparable concentrations.

Acute lethality results are not included in this report but will be presented in two separate six month reports. A summary of the twelve-month acute toxicity results was not available at time of printing.

[2] Allied Chemicals final effluent stream is pumped into General Chemical's settling basin before final discharge into the Detroit River.

I INTRODUCTION

The Municipal-Industrial Strategy for Abatement (MISA) Program is a regulatory initiative of the Ontario Ministry of the Environment which has the ultimate goal of the virtual elimination of persistent toxic contaminants from effluent discharges to Ontario's waterways. The MISA program has two regulatory phases; the effluent monitoring and effluent limits regulations.

Effluent monitoring regulations were promulgated for each of nine industrial sectors which are comprised exclusively of direct dischargers. These monitoring regulations required direct dischargers to monitor site effluent for a full twelve-month period. The monitoring phase of the program is now complete for all industrial sectors.

After completion of the twelve-month monitoring program, ICS plants were required to continue with the daily monitoring requirements of the regulation, including flow measurement, for the duration of the time interval between the monitoring and limits regulations. In addition monitoring requirements that were in existence prior to the MISA monitoring period were resumed.

This report presents all of the plant monitoring data obtained under the Effluent Monitoring Regulation for the ICS with the exception of quality assurance and quality control (QA/QC) data. The QA/QC data analysis will be presented in a separate report (Ref.1).

The plant monitoring data is presented in tabular form as twelve-month average concentrations and loadings for all plant effluents. Graphical plots are presented of total plant flows and loadings for a number of conventional contaminants. Intake water data, where available, is presented alongside effluent data to provide background information on the presence of intake water contaminants.

The results of Ministry inspection sampling conducted during the monitoring period is presented in a summary comparison of plant monitoring data and Ministry inspection data.

Plant monitoring data, subject to any QA/QC qualifications, will be used in conjunction with performance data obtained from the Best Available Technology Economically Achievable (BATEA) Global Study to set effluent limits for the ICS in the limits phase of the MISA program.

II BACKGROUND

Data summarized in this report was submitted as a regulatory requirement of the general Ontario Regulation 695/88 as amended by Ontario Regulation 533/89, and the sector-specific Ontario Regulation 395/89 and its three amendments.

Twenty-eight ICS plants monitored their effluent streams for the twelve-month regulated monitoring period.

Twenty-two plants were included in the ICS under the original Ontario Regulation 395/89 which began the regulatory monitoring period on December 1, 1989. Seven industrial gas plants were then added for twelve months of monitoring as of February 1, 1990 under an amendment by Ontario Regulation 649/89.

One plant, Canadian Liquid Air, Courtright, was shutdown in 1989 before monitoring commenced, while a second site, Fiberglas Canada, Sarnia, ceased production in May, 1990, leaving a total of twenty-seven sites in the Sector. Monitoring data for Fiberglas is included in this report although it was not verified by the plant. Allied Chemical Canada (Amherstburg) and Cyanamid Canada (Niagara Falls plant) recently announced planned shutdowns in 1992.

The development document for the effluent monitoring regulation for the ICS provides the technical rationale for the parameters selected for monitoring during the twelve month regulatory period and their associated monitoring frequencies (Ref.2).

II-A The Inorganic Chemical Sector

The ICS in Ontario is extremely diverse. The twenty-eight plants covered in this report range from small single product facilities such as abrasives, carbon dioxide, sulphuric acid, explosives and carbon black plants to large multi-product facilities such as the fertilizer plants.

Table 1 provides information on each facility covered by this report. Information is provided on plant location, number of employees, major raw materials, products, effluent treatment and number of monitoring points.

II-B The Monitoring Regulation

Each site was required to characterize its process and combined effluent for the ICS list of contaminants on at least a semi-annual basis. The ICS list contains one hundred and fifty four contaminants of which sixteen are described as conventional and non-EMPPL contaminants while the remainder are listed on the Effluent Monitoring Priority Pollutant List (EMPPL) (Ref. 3,4). The EMPPL is a list of toxic pollutants that have been detected or are potentially present in Ontario municipal and industrial effluent and pose a hazard to the receiving environment.

Selected parameters from the ICS list were required to be monitored on a more frequent basis ranging from daily and thrice-weekly to weekly and monthly monitoring. Once-through cooling water streams were required to be monitored monthly.

An open scan was also required as part of the characterization analysis to identify and approximately quantify additional organic and elemental contaminants present in the effluent stream and not listed on the EMPPL. If confirmed to be present, these additional contaminants will be subject to a hazard assessment for possible future additions to the EMPPL. The results of open scans are not presented in this report but are handled separately as part of the EMPPL updating process.

Intake water monitoring was not a regulatory requirement but seventeen of the twenty-eight sites provided some intake monitoring data.

Monthly acute toxicity testing of process type effluent streams using trout and Daphnia magna was a requirement of the regulation. Once-through cooling water final effluent streams were required to be monitored for toxicity on a quarterly basis.

II-C Database Size

Approximately 226,000 data points were collected during the twelve-month monitoring period, of which approximately 36,000 were collected for field QA/QC, while 9000 were generated as a result of Ministry inspection sampling.

Data was collected for twenty-eight plants discharging process, combined, batch, once-through cooling water, storm water and waste disposal site effluent streams.

Approximately 300 (0.14% of the database) of these data points were rejected on the basis of the adopted remark code policy which is explained later under "Management of Data with Remark Codes", while an additional 3550 (1.6% of the database) data points were coded with the "no effluent" remark code indicating that there was no effluent discharge.

II-D Management of Data With Remark Codes

Data submitted to the Ministry under the MISA Data Entry System (MIDES) may have been accompanied by one of many designated remark codes. These remark codes were incorporated in MIDES to allow for qualification of data in special cases such as for missing data due to no effluent flow, analytical interference problems, improper preservation of samples or the use of approximate values.

All data accompanied with remark codes was managed as follows:

* **Data Accepted;** <, <DL, <T, <W, <WE, ?, IM.

  (Note: Values from zero to RMDL/10 were replaced by RMDL/10)

* **Data Accepted;** A, AR, N/A, AIS, I.
  (except where the value was zero)

* **Data Rejected;** >, OLD, UQC, SIP, UCR, IB, IC, !IN, NM.

These remark codes are summarized in Appendix E-1. Data with remark codes exist in the electronic database and is not reproduced with the remark codes in this report.

II-E Reporting

Monitoring data was reported to the Ministry Regional Office by means of a customized computer diskette as part of MIDES.

The data was then transferred into the Ministry's central computer system after it was checked for completeness.

II-F Validation

To verify that the integrity of the original database was maintained, validation of the final downloaded database was necessary. Data validation procedures adopted included the production of a series of data downloads from the Ministry's central computer and the generation of statistical reports which highlighted data outliers, multiple entries, averages and various other statistical parameters. Validation included site reviews of raw data and various statistical reports, in addition to data entry error corrections carried out through the Ministry Regional Offices.

Statistical outliers were included in the database since it could not be determined that their values were not representative of actual operating conditions. Data with potential QA/QC problems was not excluded from the database for the purposes of this report. The quality evaluation of the data, including checks for "false positives" and "false negatives" is reported in a separate report (Ref. 1).

II-G Quality Assurance/Quality Control (QA/QC)

The monitoring regulation specified field QA/QC requirements for each site. Field duplicates, travelling blanks and travelling spiked blanks were required to be taken monthly or quarterly, depending on the specific parameter's monitoring frequency.

In addition Sector companies were required to submit information on analytical procedures they would adopt to indicate how Ministry specified analytical protocols would be met. The Ministry inspected all commercial and plant site analytical laboratories involved in the MISA program in order to verify the submitted information and to ensure that good laboratory practices had been followed.

II-H Ministry Inspections

Prior to commencement of the monitoring regulation, Ministry staff inspected automatic samplers and flow monitoring devices with respect to MISA requirements.

During the monitoring period, additional Ministry site inspections were made to assess compliance with MISA monitoring requirements with respect to sampling, flow measurement, analysis and record keeping. Inspection samples were also collected and the results were compared with analytical data collected by the plants for process type effluents. A summary comparison table of Ministry inspection data and plant monitoring data for "found" parameters is presented in Appendix D.

III DATA INTERPRETATION

III-A Graphical Plots and Concentration/Loading Tables

Concentration/loading tables presented in Appendix B include RMDL values which may be used to interpret the analytical significance of data presented. The RMDL is the maximum allowable method detection limit (MDL) for a laboratory providing data under the Regulation. The MDL is the minimum concentration of a parameter necessary to conclude that it is present in a sample with a level of confidence greater than 99%.

For the purposes of calculating averages, data with values down to the RMDL/10 was included in the data analysis. Low level data between zero and RMDL/10 was substituted with the value of RMDL/10. This resulted in an average biased slightly high for cases where the contaminant concentrations were reported as a series of "less than" values. The use of zero for such results would have biased the average downwards. Zero values or omitted values in the database were not included in the calculations.

Data with concentration values close to the MDL incorporate appreciable levels of random background "noise". For example, where a contaminant is actually present at the MDL, a single analysis will give a result approximately 1 time out of 20, outside the range of +/- 67% of the MDL (see Appendix E-3 for further discussion). As a result, the average concentration for parameters close to the MDL should be considered to be semi-quantitative. Averaging over many analytical results is needed to reduce "noise" related effects and increase the confidence which can be placed in the average concentration value.

Where average concentration values are based on values higher than the MDL, the average data can be interpreted more closely. For average concentration values at 5 times the MDL for instance, a single analysis result will give a result approximately 1 time out of 20, outside the range of ± 13% of this average concentration value. Concentration values well above the RMDL will therefore likely have a smaller uncertainty range than for those around or below the RMDL.

Interpretation of loadings data is subject to flow measurement accuracy considerations in addition to those factors above. Plants were required to measure process effluent streams to within an overall accuracy of ± 7% while combined and once-through cooling water streams were subject to a ± 20% accuracy. Footnotes have been provided in the concentration/loading tables where flow measurement accuracies may be uncertain.

In reviewing the loading data, consideration of the flowrate is important for contaminants that are detected close to the detection limit particularly for plants with high flowrates. For such plants, the calculated loading will appear to be significant due to the associated high flow. Loading data should therefore be reviewed in conjunction with concentration and flow data to determine its relative significance.

Daily loadings were calculated by multiplying the daily concentration value by the daily flow value. Twelve month average values were calculated by summing daily loading data over the twelve-month period and dividing by number of data points in the summation.

Effluent streams listed in the monitoring data tables in Appendices B, C and D are coded according to stream type and number. Stream types are designated as follows: IN, intake water; PR, process effluent; CO, combined effluent; BA, intermittent; discharges of process effluent; OT, once-through cooling water; ST, storm water effluent; WA, waste disposal site effluent.

Appendix E-1 includes a Reported Data Remark Codes Summary table listing all remark codes that were used in reporting ICS monitoring data. Appendix E-2 contains Provincial Water Quality Objectives/Guidelines, where available, which may be used in data interpretation. Appendices E-3 and E-4 include background information on data confidence limits and a glossary of selected terms respectively.

Additional information on the number of values reported for each parameter, average monthly concentration and loading data is available from the MISA Office.

III-B Definition of "Found" Parameters

Parameters were listed as "found" unless an approximate proportion of 0.9 of the concentration results had values less than the RMDL. This is known as the 90/10 edit rule. In a limited number of instances, where analytical interference problems were encountered, the concentration value reported with the relevant remark code was used. Because these concentration values exceeded the RMDL, some parameters may have been categorized as "found" even though their presence or absence is uncertain. This approach was taken to avoid overlooking the possible presence of such parameters in limits setting.

Data for a basic group of 10 core conventional parameters (designated as ATG "c" (Analytical Test Group)) were listed in the concentration/loading tables for all sites regardless of the editing rule. For a small number of samples, the 90/10 edit rule was modified to include listing of parameters as "found" unless the following minimum number of values at less than RMDL were reported: 2 of 2; 3 of 3; 3 of 4; 3 of 5 or 4 of 6.

A blank entry in the concentration/loading tables, unless otherwise stated, indicates that the parameter was either not "found", not monitored for that particular stream, or a loading value was not appropriate for the particular parameter, e.g. as for flow, pH and specific conductance parameters. A parameter is always displayed however, if it was "found" in one or more other streams at the plant.

Plant monitoring data with only single analytical results was not included in the tables.

III-C Intake Water

The collection of intake water flow and analytical data was not a regulatory requirement and therefore was not subject to verification by Ministry inspections.

Intake water monitoring ranged from none for eleven sites, to a complete frequency match with the effluent stream for one plant. Typically intake samples were collected

monthly. Intake water monitoring frequencies are included in Appendix E-3.

With few exceptions, intake flow measurement data was not provided. However, when available, it was not used in the estimation of intake loadings since the accuracy of intake flow measurement devices was not subjected to verification by the Ministry.

The average twelve-month intake loadings were calculated therefore, by multiplying the mean intake concentration value by the mean total effluent flowrate leaving the plant. Intake water flowrates and loadings may be overestimated as a result for some plants particularly for those with large catchment areas and which discharge their storm and process effluent through the same discharge location.

Caution should therefore be exercised when interpreting loading contributions from intake water streams since displayed intake loadings are based on a relatively limited and variable database and this is not readily apparent when reviewing the graphical plots or data tables.

III-D Storm Water and Waste Disposal Site Effluent Data

Storm water and waste disposal site effluent monitoring were included in the monitoring regulation in order to provide estimates of their relative contributions of contaminants to surface watercourses.

Conventional parameters, designated as ATG "c" for the purposes of this report, are listed in the tables in Appendix C regardless of their frequency of occurrence while the remaining contaminants were listed if they met the 90/10 editing criteria, that is the contaminant was listed unless a statistical proportion of 0.9 of the sample concentration values were less than the RMDL.

Limited qualitative interpretations should be made with storm water and waste disposal site effluent data since the database may be less representative of actual effluent discharge conditions compared to process effluent type streams for the following reasons:

- only one storm event per month was sampled;
- only one grab sample was collected for the storm event;
- flow measurement accuracy was not regulated;
- contaminant concentration values and frequency of detection are dependent on when the sample was collected during the storm event.

III-E Polychlorinated Dibenzo-p-dioxins and Dibenzofurans (PCDD's/PCDF's)

In this report PCDD's and PCDF's refer to a group of 75 related chemical compounds known as polychlorinated dibenzo-p-dioxins (PCDD's) and a group of 135 related chemical compounds known as polychlorinated dibenzofurans (PCDF's).

For simplicity the substances are grouped by the number of chlorine atoms per molecule.

PCDD/PCDF's possess similar chemical structures, biological potencies and may share a common action mechanism at the cellular level. The most potent forms of these compounds are those containing 4 chlorine atoms symmetrically placed in the molecular structure at positions labelled 2,3,7 and 8. The compound 2,3,7,8 tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) is the most acutely toxic of all the PCDD's and PCDF's in laboratory testing. With more chlorines per molecule the potency declines to the lowest value provided by octachlorodibenzo-p-dioxin (O8CDD) which is the least toxic and most commonly encountered form. It is approximately 1000 times less toxic than the 2,3,7,8-TCDD. PCDD/PCDF's data contained in this report are based on "isomer group analysis", except for the 2,3,7,8-TCDD isomer which was measured separately.

PCDD/PCDF's are not intentionally made for any industrial purpose. They may inadvertently be created as by-products in the manufacture of other chemicals or formed as a result of incomplete combustion of mixtures containing chlorine and organic compounds. They are usually found only in extremely low concentrations and normally measured at the picograms/litre (parts per quadrillion) level, which is in a range of 100-1000 times less than that for other EMPPL parameters.

Measurement of PCDD's and PCDF's at these low concentrations has forced the adoption of special "state of the art" techniques of chemical analyses. The results of PCDD/PCDF's determinations require extra caution in interpretation since they may be strongly influenced by several factors. These include:

- the increased statistical "noise" component of the data which occurs when operating at or near the limits of the special analytical techniques;
- the matrix effects caused by the presence of other materials which become more pronounced when analyzing at low concentration levels;
- the hydrophobic properties displayed by many of the PCDD/PCDF's can lead to unrepresentative sampling due to the tendency they show to adhere to any solid particles in the effluent;
- the relatively low number of samples analyzed for PCDD/PCDF's.

IV DISCUSSION OF RESULTS

IV-A Graphical Plots of Selected Conventional Parameters and Total Plant Flows (Appendix A)

In Appendix A, graphical plots are presented of twelve-month average total plant flows and loadings for seven of the ten core conventional contaminants which were frequently monitored in ICS effluents. The following conventional parameters were plotted; TSS, DOC, oil and grease, phosphorus, ammonia and ammonium nitrogen, nitrate and nitrite nitrogen, and Kjeldahl nitrogen.

The graphical plots, based on flow and loadings data presented in Table A-1 in Appendix A, provide a basis for comparison of loadings for common conventional contaminants across the Sector, readily identifying larger dischargers and indicating the wide range of diversity that exists within the Sector. The plots are arbitrarily divided into upper, mid and low ranges for purposes of presentation. Total Sector loadings for these conventional contaminants are also included in Table A-1.

A number of plots show intake water loadings exceeding effluent loadings. This may due to such factors as fluctuating intake water quality and the use of estimates for intake water flowrates as opposed to direct flow measurement which was not required for intake water streams. In addition, large effluent retention times at some facilities makes it difficult to interpret intake loadings due to inherent time delays between intake flow and effluent discharge. (see also sub-section III-C, "Intake Water").

In general, a review of the plotted data for the twenty-eight plants shows that the following plants produced the largest discharge loadings for the seven conventional contaminants; Cyanamid Canada (Welland Plant), General Chemical and ICI (Courtright). These plants also have relatively high effluent discharge flowrates.

IV-B Concentration/Loading Tables (Appendix B)

The plant monitoring results for the ICS are tabulated in Appendix B. Monitoring data is presented in the form of twelve-month averages of the concentration, flow and loading values for parameters in individual effluent and intake (where available) streams at each of the plants.

All monitored parameters were listed in the tables if they were "found" according to the 90/10 edit rule, except for the first ten core conventional parameters (ATG "c") which are listed irrespective of the editing rule.

The data provided in the tables is calculated based on the daily, thrice-weekly, weekly, monthly, semi-annual and quarterly data sets. All concentration/loading data presented were rounded to three figures. Loading values of less than one gram per day were omitted from the tables.

IV-C Storm Water and Waste Disposal Site Effluent (Appendix C)

Storm water and waste disposal site effluent results are contained in Appendix C.

Storm water concentration and flow data were rounded to two figures while storm loading data was rounded to one figure to reflect the lower level of accuracy associated with the latter. The loadings presented may be representative within an order of magnitude of many of the larger storm events occurring at each plant site.

IV-D Polychlorinated Dibenzo-p-dioxins and Dibenzofurans (Appendix D)

PCDD's and PCDF's were "found" in effluent streams from eleven plants at mean concentration levels greater than the RMDL and are shown on pages D-17 and D-18. The concentration levels vary over a wide range which is typical for these types of compounds and may be attributed to particulate association. 2,3,7,8 TCDD, the most biologically potent of the compounds, was not "found" in any of the effluent streams at mean concentrations above the RMDL despite the T4CDD isomer group being "found" at four sites.

PCDD/PCDF's were identified in three process streams at the Allied Chemical plant in Amherstburg (which is being shutdown), principally the O8CDD and O8CDF isomer groups. The T4CDD group was additionally identified in one stream at a mean concentration close to the RMDL.

Both the chlorofluorocarbon collection sump stream (PR 0100) and the hydrochloric acid stream (PR 0600) which recorded the highest PCDD and PCDF concentrations, receive additional treatment in the form of settling and pH adjustment before dilution in General Chemical's soda ash settling basin and discharge into the North Drain (General Chemical's CO 0100).

For General Chemical and Cyanamid Canada (Welland Plant), the most commonly found and the least toxic form of the dioxins, O8CDD, was detected in the intake stream at comparable levels to the effluent stream. General Chemical additionally identified 6 isomer groups ranging from T4CDF to H7CDD.

At ICI, Cornwall, the cell room effluent stream (PR 0400), recorded the highest concentration of dioxins and furans for the two effluent streams monitored. This stream is diluted approximately in a ratio of eighteen to one with cooling water before being discharged into the final effluent stream (CO 0300).

O8CDD was identified in effluent streams from the IMC and UCAR Carbon facilities while the O8CDF isomer group was additionally identified in effluent from ICI's CONPAC packaging facility, and the Linde Moore Township and UCAR Carbon plants.

Linde's Sarnia and Sault Ste. Marie plants identified a total of six and seven isomer groups respectively with unusually high values of the hexa and hepta isomers for the Sault Ste. Marie facility. The highest concentration levels of the O8CDD isomer group in the ICS was also recorded for this plant. Nitrochem's Maitland plant detected a total of five isomer groups ranging from the O8CDD to the H6CDF.

IV-E Ministry Inspection Data (Appendix D)

To verify the quality of the monitoring data, at least one Ministry inspection sample was collected during the monitoring period for each site with process type effluent streams. Summary comparison tables are provided in Appendix D which compare the 99'th percentile concentration value for "found" parameters with Ministry inspection values.

The 99'th percentile concentration value is defined such that, if the concentration values are arranged in ascending order, 99% of them would fall below and only 1% would exceed that specific concentration value. It is calculated from statistical formulae that are selected for normal, log-normal and non-parametric distributions of the data. The 99'th percentile of a data set has traditionally been used to represent the upper most value that could be considered statistically part of the data set, while a higher value is assumed to be a statistical outlier. It has been chosen as a basis for comparison in this report since it thereby takes account of the variability of the plant monitoring data.

Ministry inspection sample results, with few exceptions, were determined to be within the 99'th percentile concentration value of the plant monitoring data values and therefore showed that there was no major systematic difference between the two data sets. The industry data therefore appears reliable for use in limit setting.

PCDD's and PCDF's results were not included in the above comparisons due to the unusual variability associated with measuring such compounds. A summary table of PCDD/PCDF's "found" at eleven of the ICS plants with mean concentration values at or above the RMDL is presented on pages D-17 and D-18. Also included in the tables are Ministry inspection concentration values for these particular compounds.

Ministry inspection results for PCDD's and PCDF's confirmed their presence in effluent from each of the eleven ICS plants mentioned in the previous subsection. Ministry inspection sampling detected low levels of the O8CDD isomer group just above the RMDL for two plants not listed in the PCDD/PCDF summary table, these were Cabot (Sarnia) and Cyanamid (Niagara) plants. Subsequent Ministry sampling and analysis however at both facilities failed to confirm the presence of PCDD/PCDF's.

IV-F Summary of Parameters Found in ICS Effluents (Tables 2-4)

Table 2 is a summary of conventional parameters detected with mean concentration values at or above the RMDL and of non-EMPPL parameters which were "found" in ICS effluent streams. Parameters detected at more than an arbitrary five times the RMDL are also indicated to highlight contaminants showing relatively larger concentration values. In Table 2, pH values which fall outside the range of the Provincial Water Quality Objective (PWQO) of 6.5 - 8.5 are only included, while specific conductance values which are greater than an arbitrary 1000 micro Siemens per centimetre are also listed to highlight relatively larger specific conductance values.

Table 3 presents a list of EMPPL parameters that were monitored by the Sector plants and shows those which were "found" in ICS effluent streams (excluding storm water).

The above tables are useful as a screen for readily identifying contaminants that have

been "found" at individual sites. Some of the parameters listed were detected at monitoring locations situated upstream of dilution from other effluent streams. Interpretation of these tables should include cross references to the concentration/loading tables in Appendix B which show data for individual effluent and intake water streams that were monitored at each plant.

A total of one hundred and thirty-eight EMPPL parameters were specified for monitoring in the regulation of which eighty-six were "found" with mean concentrations at or above the RMDL. Individual site "found" parameter totals for process type effluent streams ranged from sixty-four for the Allied Chemical Amherstburg plant (of which forty-four were confirmed by the plant) to four for the Washington Mills abrasives plant and the Liquid Carbonic industrial gas (Courtright and Maitland) plants.

Of twenty-one compounds listed on the Ministry's recently released Primary List of Candidate Substances for Bans or Phase-Outs (Ref.5), seven were "found" in ICS effluent streams.

Within the Sector, the largest dischargers of EMPPL compounds include Allied Chemical, General Chemical and ICI's Cornwall and Courtright facilities. Table 4 presents the total plant loadings of EMPPL compounds to surface watercourses for these dischargers.

Aluminum, boron, strontium and zinc were commonly "found" across the Sector while the remaining metal parameters were "found" in effluent for less than one quarter of the plant locations. Several of the metals were found in intake water at comparable levels to the effluent streams. Aluminum is often present in suspended clay particles in raw water while boron is sometimes found naturally in solution in water. Strontium like calcium is a naturally occurring constituent of hard water. The unusually high strontium loading levels for General Chemical is partially a direct consequence of the processing of calcium containing minerals.

Metals analyzed by hydride generation, consisting of arsenic, antimony and selenium were "found" in effluents from approximately one quarter of the facilities. Hexavalent chromium was "found" in effluent from two facilities only. Many of the metals may originate as constituents of process materials, equipment corrosion and catalysts. The ICI Cornwall facility for instance, which has the largest discharge of mercury in the Sector, operates a mercury cell chlor-alkali facility. Vanadium and antimony may be related to process catalysts at some sites while chromium(III), copper, nickel, lead and zinc may be products of equipment corrosion.

Organic contaminants make up the majority of the remaining EMPPL parameters. The number of detections and the loadings are both relatively low, in part because only one of the plants manufactures organic chemicals.

Halogenated and non-halogenated volatile compounds were "found" in effluent at approximately half of the sites. Water soluble compounds (acrolein and acrylonitrile) were "found" in effluent at three plant locations only.

Base neutral extractables were not "found" in any effluent streams, except for the three phthalate compounds which are commonly used as plasticizers in polymeric materials used for process piping and auto sampler flexible tubing. Polycyclic aromatic hydrocarbons (PAH's) were at RMDL levels for one facility and were also detected at comparable concentrations in the intake water.

Acid extractables similarly were not "found" except for phenol which was at RMDL values for three of four facilities.

Chlorinated neutral extractable organic compounds were "found" at two facilities where chlorinated organic compounds are manufactured on-site or at a nearby plant. Polychlorinated biphenyls (PCB's) were "found" in effluent at only two plants at levels less than or close to the RMDL.

V REFERENCES

(1) Ontario Ministry of the Environment, "Report on the Assessment of the Quality Assurance and Quality Control Data for the MISA Inorganic Chemical Sector (Draft)", 1992.

(2) Ontario Ministry of the Environment, "The Development Document for the Effluent Monitoring Regulation for the Inorganic Chemical Sector", July 1989, ISBN O-7729-5700-2, Queen's Printer.

(3) Ontario Ministry of the Environment, "The Effluent Monitoring Priority Pollutant List (1987)" ISBN 0-7729-2784-7, Queen's Printer.

(4) Ontario Ministry of the Environment, "The Effluent Monitoring Priority Pollutants List - 1988 Update", March, 1989, ISBN 0-7729-5450-X, Queen's Printer.

(5) Ontario Ministry of the Environment, "Candidate Substances List for Bans or Phase-Outs", April, 1992, ISBN 0-7729-9764-0, Queen's Printer.

Table 1 – Overview of Inorganic Chemical Sector Plants.

Plant Name	Location	Number of Employees	Major Raw Materials	Products and Intermediates	End of Pipe Treatment	Number of Monitoring Points
Albright and Wilson Americas	Port Maitland	70	Phosphorus.	Phosphoric acid, various sodium and potassium phosphates.	None	3
Allied Chemicals	Amherstburg	100	Fluorspar, sulphuric acid, chloroform, carbon tetrachloride.	Hydrofluoric acid, chlorofluoro–carbons.	Settling and neutralization	5
Cabot Canada Ltd.	Sarnia	180	Aromatic tars, methane	Carbon black.	Settling, filtration	2
Columbian Chemicals	Hamilton	120	Coal tar distillate, petroleum hydrocarbons.	Carbon black.	None – storm discharge only.	2
Cyanamid Canada (Niagara Plant)	Niagara Falls	300	Diamide lime, coke, lime.	Calcium carbide, calcium cyanide, desulphurizing reagent, calcium cyanamide.	None	3
Cyanamid Canada (Welland Plant)	Niagara Falls	135	Calcium cyanamide, carbon dioxide, phosphorus.	Dicyandiamide, cyanamide solutions (50%), phosphine and derivatives, diamide lime, DICY mother liquor slurry, electronic grade chemicals.	Equalization	1
ETI	North Bay	185	Monomethylamine nitrate (MAN), ammonium nitrate (AN), fuel oil (FO), nitric acid.	Water gel MAN based explosives, ammonium nitrate/ fuel oil (ANFO) explosive, water gel/ANFO mixed explosives.	None	4
Exolon–Esk	Niagara Falls	100	Bauxite, coke, iron borings.	Alumina abrasives and ferrosilicon.	Settling	1

Table 1 – Overview of Inorganic Chemical Sector Plants.

Plant Name	Location	Number of Employees	Major Raw Materials	Products and Intermediates	End of Pipe Treatment	Number of Monitoring Points
Fiberglas (not operating)	Sarnia	none	Sand, alumina, sodium carbonate/sulphate.	Glass fibre articles.	None	1
General Chemical	Amherstburg	500	Natural brine, coke, limestone.	Soda ash, calcium chloride.	Settling, neutralization	2
ICI Conpac	Cornwall	40	Repackaging of: sulphuric acid, nitric acid and hydrochloric acid, sodium hydroxide solutions, potassium hydroxide solutions, hydrogen peroxide solutions ammonia solutions, acetic acid and acetic acid solutions, sodium hypochlorite solutions, fluorosilicic acid solutions and chlorine.		Settling, neutralization.	1
ICI	Cornwall	160	Sodium chloride.	Caustic soda, chlorine, hydrogen, hydrochloric acid, chlorinated paraffins, sodium hypochlorite.	Sulphide precipitation, carbon adsorption.	2
ICI	Courtright	275	Air, natural gas.	Ammonia, ammonium nitrate, urea, sulphur coated urea, nitric acid, ammonium nitrate solutions.	None	9
IMC (being decommissioned)	Port Maitland	12	Phosphate rock, sulphuric acid.	Phosphate fertilizer.	Lime precipitation.	1
Liquid Carbonic	Courtright	12	Raw carbon dioxide	Refined carbon dioxide.	None	1
Liquid Carbonic	Maitland	12	Raw carbon dioxide	Refined carbon dioxide.	None	1
Linde	Moore Township	0	Air.	Nitrogen gas.	None	1
Linde	Sarnia	12	Air.	Nitrogen gas.	None	1

Table 1 – Overview of Inorganic Chemical Sector Plants.

Plant Name	Location	Number of Employees	Major Raw Materials	Products and Intermediates	End of Pipe Treatment	Number of Monitoring Points
Linde	Sault Ste. Marie	20	Air.	Oxygen, nitrogen and argon. ammonia, ammonium nitrate (solids and solutions).	None	1
Nitrochem	Maitland	175	Air, natural gas.	Nitric acid, ammonia, ammonium nitrate (solids and solutions).	Partial recycle.	2
Norton	Niagara Falls	255	Bauxite, coke, iron borings, chromium III oxide.	Alumina, zirconia and chrome oxide abrasives.	Settling, oil separation.	4
Partek	Sarnia	130	Dolomite, slag, coke, basalt rock.	Insulation fibre.	None	4
Puritan–Bennett	Maitland	6	Ammonium nitrate	Nitrous oxide	None	1
Sulco Chemicals	Elmira	20	Sulphur.	Sulphuric acid. Repackages hydrochloric, hydrofluoric and phosphoric acids.	Filtration, settling and neutralization.	2
UCAR Carbon	Welland	450	Petroleum coke, coal tar pitch binder.	Carbon and graphite electrodes.	None	6
Washington Mills Electro–Minerals	Niagara Falls	100	Bauxite, coke and iron borings.	Fused alumina and mixed abrasives.	Settling	1
Washington Mills	Niagara Falls	35	Bauxite, coke and iron borings.	Fused alumina abrasives.	Settling	2
Welland Chemical	Sarnia	60	Aluminun ingots, chlorine.	Aluminum chloride, sodium hypochlorite and packaged chlorine.	Settling and neutralization.	5

Table 2 – Summary of Conventional Parameters Detected with Mean Concentrations At or Above RMDL and "Found" Non–EMPPL Parameters.

ATG	CONVENTIONAL PARAMETERS	RMDL	PLANT CODE (see legend below)																											
			ALB	ALL	CAB	CYN	CYW	ETI	EXE	FIB	GEN	I–a	I–b	I–c	IMC	LCC	LCM	LMO	LSN	LSS	NIT	NOR	PAR	PUR	SUL	UCW	WEL	WEM	WMI
c	Total suspended solids	5 mg/L		X		X	X	O	O	X	X	X	X	X	O			O	O	O	X	O			O	O	X	O	O
c	Hydrogen Ion (pH)			X		X					X	X	X								X								
c	Specific conductance	uS/cm		X							X	X		X	X						X			X	X	X	X		X
c	DOC	0.5 mg/L	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	O	O	X	X	X	X	X	O
c	TOC	5 mg/L		O			X	O			X	O	O	X	O	O		O	O	O	X		X		O		O		
c	Oil and grease	1 mg/L	O	O	O	O	O	O	O	O	O	X		O	O	O	O	O	O	O	X	O	O		O	O	O	O	X
c	Ammonia plus Ammonium	0.25 mg/L				O	X	X		X	X		X	X	O	O	O		O		X	O		X	O		X		O
c	Nitrate+Nitrite	0.25 mg/L	O	O	O	X	X	X		O	O	X	X	X	O		X	X	X	X	X	O		X	X	O	O		
c	Total Kjeldahl nitrogen	0.5 mg/L		O	O	O	X	X		O	X	O	X	X	O	O	O	X	X	O	X	O		X	O	O	X	O	O
c	Total phosphorus	0.1 mg/L		X			X	O	O		O	X	O	X	X		O	X	X	X	X	O		O	X				
c*	Volatile Suspended Solids	10 mg/L					O		O			X	O	O							O	O	O			O		O		
c*	Chemical Oxygen Demand	10 mg/L		X	O	O	X		O		X	X	O	X	O			X	X	O	X	X			X	O	X	O	X

"X" indicates a mean value of five times or more of the RMDL – "O" indicates a mean equal to or larger than RMDL.

	NON–EMPPL PARAMETERS																												
I1	Chloride	2 mg/L	X	X	X	X	X		X	F	X	X	X	X	X			X	X	X	X	X			X	X	X	X	X
I2	Fluoride	0.1 mg/L	F	X	F	F	F		F	F	X	X		X	X			X	X	F	F	F			X	F	F		X
I3	Sulphate	5 mg/L	X	X	X	X	X		X	F	X	X	X	X	X			X	X	X	X	X	F		X	X	F	F	X
14	Phenolics (4AAP)	2 ug/L	F	X	F	F	F		F	F	F	F	X	X	F				F	F	X	F			F	F	X	F	F

"X" indicates a "found" parameter at a mean value of five or more times RMDL – "F" indicates "found" at less than five times RMDL.

Plant Code Legend

Albright and Wilson	ALB	ICI Cornwall	I–a	Nitrochem	NIT
Allied Chemicals	ALL	ICI Courtright	I–b	Norton	NOR
Cabot Canada	CAB	ICI Conpac	I–c	Partek	PAR
Cyanamid Niagara	CYN	IMC	IMC	Puritan–Bennett	PUR
Cyanamid Welland	CYW	Liq. Carb. Courtr.	LCC	Sulco	SUL
ETI	ETI	Liq. Carb. Maitl.	LCM	UCAR Carbon Welland	UCW
Exolon–ESK	EXE	Linde Moore	LMO	Welland Chemical	WEL
Fiberglas	FIB	Linde Sarnia	LSN	Washington El. Min.	WEM
General Chemical	GEN	Linde Sault.	LSS	Washington Mills	WMI

Table 2 – Summary of Conventional Parameters Detected with Mean Concentrations At or Above RMDL and "Found" Non–EMPPL Parameters.

Explanatory Notes:

See section III of the report for general comments on data interpretation.

"Core" conventional parameters are those marked as ATG (analytical test group) c. Data from all plant effluent streams has been considered including streams which were monitored upstream of dilution before discharge. The conventional parameter tests are designed as sensitive indicators of changes in plant operating condition rather than as comparative pollutant control indicators. Other parameters selected for display indicate some general water qualities; the parameters are often present in plant intake water.

The parameter pH is marked 'X' where the mean pH lies outside the range 6.5 to 8.5.
Values outside this range fall outside Provincial Water Quality Objectives.

Specific conductance is marked with an 'X' when the mean exceeds 1000 uS/cm.
This value of 1000 was selected simply to indicate unusually high salt and/or acidity/alkalinity.

Parameters marked c* were measured only during semi–annual characterization.

Plants with once through cooling effluents only were not required to perform characterization and measured only a limited number of parameters. The affected plants are ETI, Puritan–Bennett and Partek.

Table 3 – Summary of "Found" EMPPL Parameters

ATG	PARAMETER	RMDL	TOX. EFF.	PLANT CODE – SEE LEGEND ON PAGE 4																										
				A L B	A L L	C A B	C Y N	C Y W	E T I	E X O	F I B	G E N	I – a	I – b	I – c	I M C	L C C	L C M	L M O	L S N	L S S	N I T	N O R	P A R	P U R	S U L	U C W	W E L	W E M	W M I
09	Silver	30 ug/L	P																											
09	Aluminum	30 ug/L	P	F	X	X	X	X	X	X	F	X	X	X	X	F	F	F	X	X	X	X	X			X	X	X	X	F
09	Boron	50 ug/L	P		X						X	X	X	X	F	F	F	F	X	X	X	F	F			F	F	F		X
09	Beryllium	10 ug/L	P									F	F																	
09	Cadmium	2 ug/L	P		X							X	F		X											F		F		
09	Cobalt	20 ug/L	P									X	F													F				
09	Chromium	20 ug/L	P		F							X	F		F				F				F							
09	Copper	10 ug/L	P		F	F				F		X	F	F	X				F	X	X	X	F			F				
09	Molybdenum	20 ug/L	P		X							X	F		X															
09	Nickel	20 ug/L	P,B		X							F	F		X											F				
09	Lead	30 ug/L	P									X	X		X											F				
09	Strontium	20 ug/L	P	F	X	X	X	X	F	X	F	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X	X	X
09	Thallium	30 ug/L	P									F	F		F															
09	Vanadium	30 ug/L	P									F	F		X							X				F				
09	Zinc	10 ug/L	P	F	X	X	X	F	F		F	X	X	X	X	F	F	X	X	X	X	X	F			X	X	F		
10	Arsenic	5 ug/L	P		X			F				F	F		F				F	F						F				
10	Antimony	5 ug/L	P,B		X			F				F			F				F	F										
10	Selenium	5 ug/L	P		F							F			F														F	
11	Chromium (hexavalent)	10 ug/L	P										F		F															
12	Mercury	0.1 ug/L	P,B	F	X			F			F	F	X	X	X							F	F			F		F		
15	Sulphide	20 ug/L				F	F	F		F	F	F	X	F		F						F	F			F		F	F	F
16	1,1,2,2–Tetrachloroethane	4.3 ug/L	P		X							F																		
16	1,1,2–Trichloroethane	0.6 ug/L			X							F																		
16	1,1–Dichloroethane	0.8 ug/L	P		X							F								F		F	F							
16	1,1–Dichloroethylene	2.8 ug/L			X																	F	F							
16	1,2–Dichloroethane	0.8 ug/L	P	F	X							F	F										F							
16	1,2–Dichloropropane	0.9 ug/L			X							F																		
16	Cis–1,3–Dichloropropylene	1.4 ug/L			X							F									F									
16	Trans–1,3–Dichloropropylene	1.4 ug/L			X							F																		
16	Bromoform	3.7 ug/L			X							F							X	F		F								
16	Dibromochloromethane	1.1 ug/L	P	F	X							F	F		F													F		
16	Chloromethane	3.7 ug/L	P		X							F		F																
16	Chloroform	0.7 ug/L		X	X	F						F	X	F	X					F	X	F	F			F		X		
16	Carbon tetrachloride	1.3 ug/L	P		X										X															
16	Methylene chloride	1.3 ug/L		X	X							F	F	X					F	X	F		X					F		
16	Trans–1,2–Dichloroethylene	1.4 ug/L	P		X																	F								
16	Trichlorofluoromethane	1 ug/L	P		X							X											F							
16	Tetrachloroethylene	1.1 ug/L			X							F	F		F							X								
16	Trichloroethylene	1.9 ug/L			X																	F								

Table 3 – Summary of "Found" EMPPL Parameters

ATG	PARAMETER	RMDL	TOX. EFF.	PLANT CODE																											
				ALB	ALL	CAB	CYN	CYW	ETI	EXO	FIB	GEN	I–a	I–b	I–c	IMC	LCC	LCM	LMO	LSN	LSS	NIT	NOR	PAR	PUR	SUL	UCW	WEL	WEM	WMI
16	Vinyl chloride	4 ug/L			X							F																		
16	1,2–Dichlorobenzene	1.4 ug/L			X																		F							
16	1,3–Dichlorobenzene	1.1 ug/L			X																F		F							
16	1,4–Dichlorobenzene	1.7 ug/L			X																F		F							
16	Chlorobenzene	0.7 ug/L	P		X																									
16	Ethylene dibromide	1 ug/L			X							F																		
16	Bromomethane	3.7 ug/L			X							F									F									
17	Styrene	0.5 ug/L			X							F									F									
17	Benzene	0.5 ug/L		F	X					F	F	F	F		F							F	F							
17	m–Xylene and p–Xylene	1.1 ug/L			X									F	F															
17	o–Xylene	0.5 ug/L			X							F			F								F					F		
17	Toluene	0.5 ug/L			X			F		F		F			X				F	F		F	F							
18	Acrolein	4 ug/L			X							F																		
18	Acrylonitrile	4.2 ug/L			X	F						F																		
19	Diphenylamine	14 ug/L	P																											
19	2,4–Dinitrotoluene	0.8 ug/L																												
19	2,6–Dinitrotoluene	0.7 ug/L																												
19	4–Bromophenyl phenyl ether	0.3 ug/L	P,B																											
19	4–Chlorophenyl phenyl ether	0.9 ug/L	P,B																											
19	Bis(2–chloroethyl)ether	4.4 ug/L	P,B																											
19	Bis(2–chloroethoxy)methane	3.5 ug/L	P																											
19	Bis(2–chloroisopropyl)ether	2.2 ug/L																												
19	Benzylbutylphthalate	0.6 ug/L												F	F											F				
19	Bis(2–ethylhexyl) phthalate	2.2 ug/L			X								F	F	F				F	F			X			F		F	F	
19	Camphene	3.5 ug/L	P,B																											
19	Di–n–butyl phthalate	3.8 ug/L			X								F		F													F		
19	Diphenyl ether	0.4 ug/L	P,B											F																
19	N–Nitrosodiphenylamine	14 ug/L																												
19	N–Nitrosodi–n–propylamine	3.1 ug/L																												
19	1–Chloronaphthalene	2.5 ug/L	B																											
19	1–Methylnaphthalene	3.2 ug/L																												
19	2–Chloronaphthalene	1.8 ug/L	P																											
19	2–Methylnaphthalene	2.2 ug/L	B																											
19	5–nitro, Acenaphthene	4.3 ug/L	B																											
19	Acenaphthene	1.3 ug/L																												
19	Acenaphthylene	1.4 ug/L	P,B																											
19	Anthracene	1.2 ug/L	P,B																											
19	Benz(a)anthracene	0.5 ug/L	P,B																											
19	Benzo(a)pyrene	0.6 ug/L	P,B																											
19	Benzo(b)fluoranthene	0.7 ug/L	P,B																											

Table 3 – Summary of "Found" EMPPL Parameters

ATG	PARAMETER	RMDL	TOX. EFF.	PLANT CODE																													
				ALB	AL	CAB	CYN	CYW	ETI	EXO	FIB	GEN	I--a	I--b	I--c	IMC	LCC	LCM	LMO	LSN	LSS	NIT	NOR	PAR	PUR	SUL	UCW	WEL	WEM	WMI
19	Biphenyl	0.6 ug/L	B																														
19	Benzo(k)fluoranthene	0.7 ug/L	P,B																														
19	Chrysene	0.3 ug/L	P,B																														
19	Dibenz(a,h)anthracene	1.3 ug/L	P,B																														
19	Fluoranthene	0.4 ug/L	P,B									F																					
19	Fluorene	1.7 ug/L																															
19	Benzo(g,h,i)perylene	0.7 ug/L	P,B																														
19	Indole	1.9 ug/L	P																														
19	Indeno(1,2,3-cd)pyrene	1.3 ug/L	P,B																														
19	Naphthalene	1.6 ug/L																															
19	Perylene	1.5 ug/L	P,B																														
19	Phenanthrene	0.4 ug/L	P,B									F																					
19	Pyrene	0.4 ug/L	P,B									F																					
20	2,4-Dichlorophenol	1.7 ug/L																															
20	2,4-Dimethylphenol	7.3 ug/L																															
20	2,4-Dinitrophenol	42 ug/L	P																														
20	2,6-Dichlorophenol	2 ug/L																															
20	4,6-Dinitro-o-cresol	24 ug/L																															
20	4-Nitrophenol	1.4 ug/L																															
20	m-Cresol	3.4 ug/L																															
20	o-Cresol	3.7 ug/L																															
20	p-Cresol	3.5 ug/L																															
20	Phenol	2.4 ug/L												F								X					F	F				
20	2-Chlorophenol	3.7 ug/L																															
20	2,3,4-Trichlorophenol	0.6 ug/L																															
20	2,3,4,5-Tetrachlorophenol	0.4 ug/L	B																														
20	2,3,4,6-Tetrachlorophenol	2.8 ug/L																															
20	2,3,5-Trichlorophenol	1.3 ug/L																															
20	2,3,5,6-Tetrachlorophenol	1.6 ug/L	B																														
20	2,4,5-Trichlorophenol	1.3 ug/L																															
20	2,4,6-Trichlorophenol	1.3 ug/L																															
20	4-Chloro-3-methylphenol	1.5 ug/L																															
20	Pentachlorophenol	1.3 ug/L	P,B																														
23	Hexachlorobutadiene	10 ng/L			X								X		F																		
23	Hexachlorocyclopentadiene	10 ng/L		F	X	F							F		F																		
23	1,2,3-Trichlorobenzene	10 ng/L			X								F		X																		
23	1,2,3,4-Tetrachlorobenzene	10 ng/L	P,B		X								F		F																		
23	1,2,3,5-Tetrachlorobenzene	10 ng/L	P,B		X								F		F																		
23	1,2,4-Trichlorobenzene	10 ng/L			X								X		F																		
23	1,2,4,5-Tetrachlorobenzene	10 ng/L	P,B		X								F		F																		

Table 3 – Summary of "Found" EMPPL Parameters

ATG	PARAMETER	RMDL	TOX. EFF.	PLANT CODE																										
				ALB	AAL	CAB	CYN	CYW	ETI	EXO	FIB	GEN	IEN	I–a	I–b	I–c	IMC	LCC	LCM	LMO	LSN	LSS	NIT	NOR	PAR	PUR	SUL	UCW	WEL	WEM	WMI
23	Hexachlorobenzene	10 ng/L	P,B		X								X			X												F		
23	Hexachloroethane	10 ng/L	P		X			F					X	X		X															
23	Octachlorostyrene	10 ng/L	B		X								X			F															
23	Pentachlorobenzene	10 ng/L	P,B		X								X			F													F		
23	2,4,5 –Trichlorotoluene	10 ng/L	P,B		X								F																		
24	2,3,7,8 TCDD	20 pg/L	P,B																												
24	Total T4CDD	20 pg/L	P,B		F								F																		
24	Total T4CDF	15 pg/L	P,B									X	X																		
24	Total P5CDD	20 pg/L	P,B		F							F	X									F									
24	Total P5CDF	15 pg/L	P,B									X	X																		
24	Total H6CDD	30 pg/L	P,B									F	F								F	X									
24	Total H6CDF	20 pg/L	P,B									F	X								F	X	F								
24	Total H7CDD	30 pg/L	P,B		F							F							F	F	X	X								
24	Total H7CDF	30 pg/L	P,B										X								F	X	F								
24	Octachlorodibenzo–p–dioxin	30 pg/L	P,B		X			X				X				X	F			F	X	X	X					F			
24	Octachlorodibenzofuran	30 pg/L	P,B		X								X			F				F	F	X	F						F		
2	Cyanide Total	0.005 mg/L				F	X	X		F	F	F	X	F						F		F	X				X				
27	PCBT	0.1 ug/L	P,B													F							F								

Notes: All the plants, except ETI, PUR and PAR, analyzed for all the above EMPPL parameters.

'X' indicates that the parameter mean concentration equals or exceeds five times the RMDL concentration in any stream excluding storms.

'F' or 'X' indicates "found" by the 90/10 edit rule in any stream at the plant (also excluding storm streams).

'TOX. EFF.' indicates the toxic effect classification; 'P' means persistent and 'B' means bioaccumulative according to EMPPL classification.

Plant Code Legend

Albright and Wilson	ALB	ICI Cornwall	I–a	Nitrochem	NIT
Allied Chemicals	ALL	ICI Courtright	I–b	Norton	NOR
Cabot Canada	CAB	ICI Conpac	I–c	Partek	PAR
Cyanamid Niagara	CYN	IMC	IMC	Puritan–Bennett	PUR
Cyanamid Welland	CYW	Liq. Carb. Courtr.	LCC	Sulco	SUL
ETI	ETI	Liq. Carb. Maitl.	LCM	UCAR Carbon Welland	UCW
Exolon–ESK	EXE	Linde Moore	LMO	Welland Chemical	WEL
Fiberglas	FIB	Linde Sarnia	LSN	Washington El. Min.	WEM
General Chemical	GEN	Linde Sault.	LSS	Washington Mills	WMI

Table 4 – Large Dischargers of EMPPL Parameters in the Inorganic Chemical Sector – Total Plant Loadings in kg/day.

		Allied Chemicals		General Chemical		ICI Cornwall		ICI Courtright	
ATG	PARAMETER	EFFLUENT	INTAKE	EFFLUENT	INTAKE	EFFLUENT	INTAKE	EFFLUENT	INTAKE
09	Aluminum	2.88	1.21	101	111	0.634	0.324	16	16.9
09	Beryllium			2.24	2.24	0.01	0.049		
09	Boron	23.7	2.38	24.4	13.6	0.997		4.36	3.37
09	Cadmium	0.057	0.006	0.675	0.449	0.032	0.036		
09	Chromium	0.14	0.072	6.32	4.49	0.079	0.077		
09	Cobalt			6.48	4.49	0.023	0.074		
09	Copper	0.081	0.041	3.37	2.24	0.082	0.068	0.349	3.05
09	Lead			10.7	7.29	0.178	0.087		
09	Molybdenum	1.05	0.062	7.37	4.49	0.046	0.128		
09	Nickel	1.14	0.062	3.46	2.24	0.037	0.053		
09	Strontium	96.2	0.58	108	27.5	14.3		17.3	16.3
09	Thallium			7.23	6.73	0.097	0.132		
09	Vanadium			4.53	4.49	0.106	0.269		
09	Zinc	1.35	0.599	3.35	16.5	0.111	0.058	0.966	7.01
10	Antimony	0.097		[0.032]	[0.031]				
10	Arsenic	1.22		[0.297]	[0.031]	0.012	0.012		
10	Selenium	0.017		[0.04]	[0.031]				
11	Chromium (hexavalent)					0.032			
12	Mercury	0.008		0.027	0.023	0.063	0.001	0.012	0.062
15	Sulphide			5.15	2.24	0.79	0.04	2.788	2.74
16	Volatile Halogenated Organics	0.998		4.63	3.45	0.068	0.042	2.320	1.29
17	Volatile Non-halogenated Organics	0.113		0.225	0.157	0.004	0.001	0.019	0.019
18	Water Soluble Volatile Organics	0.131		1.86	1.35				
19	Extractable Organics-Basic or Neutral	0.454		0.344	0.27	0.027		0.102	0.572
20	Extractable Organics-Acidic							0.065	0.519
23	Extractables-Neutral and Chlorinated	*				0.007		0.001	0.002
24	Chlorinated Dibenzodioxins and Furans	*		*	*	*			

Notes:

See Monitoring Report text section III for important details on data interpretation and appendix B for a more detailed breakout of monitoring data.

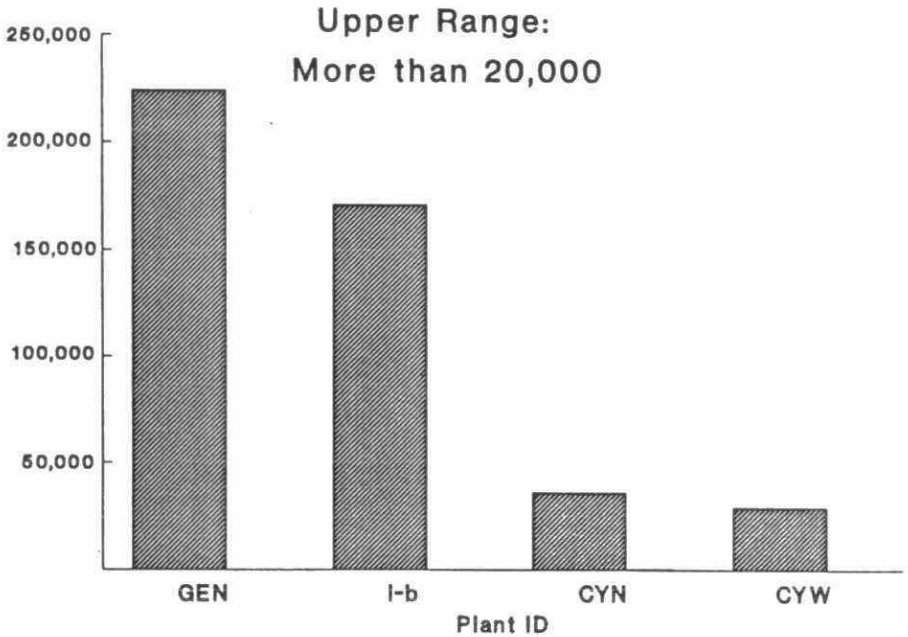
Data shown "[ ]" is based on flow at General Chemicals stream CO0100 only.

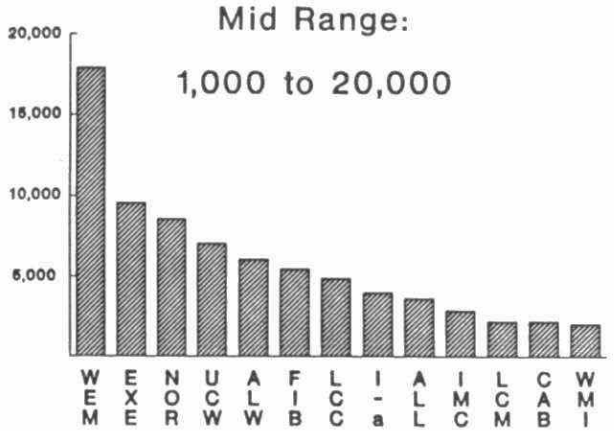
Blank cells indicate a parameter was either not "found" in any stream at the plant site or was not monitored.
"*" indicates one or more parameters in the group were found but loadings were less than one gram per day.

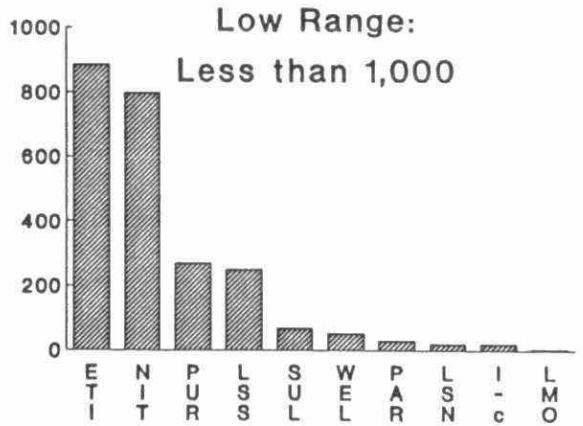
APPENDIX A

Graphical Plots of Twelve-Month Average Total Plant Flow and Loading Data for Selected Conventional Contaminants

Effluent Flow
cubic metres/day



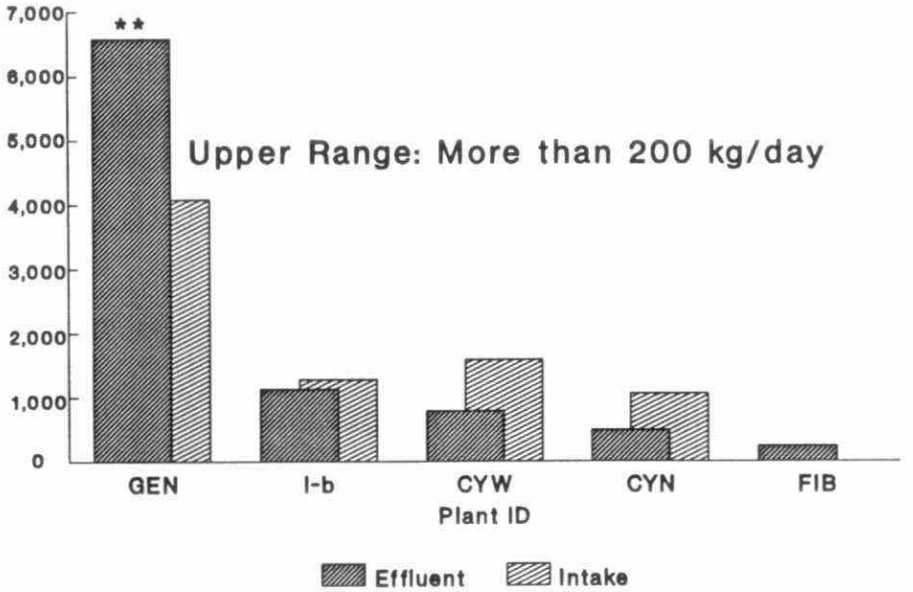


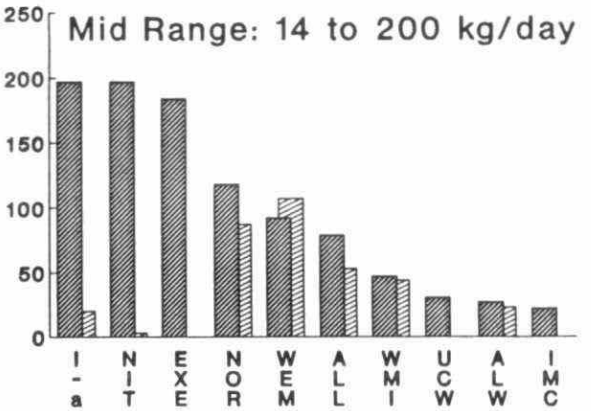


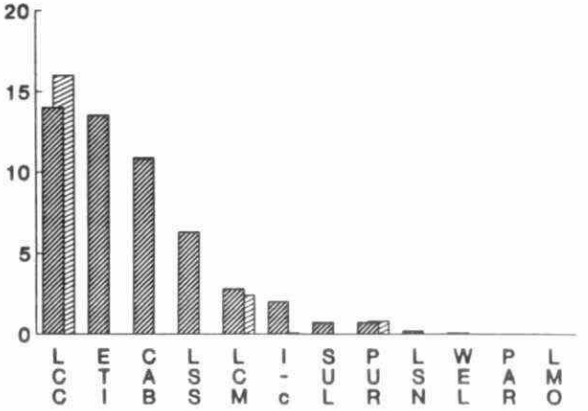
For plant codes and numerical data see table A-1.

Figure A-1

Total Suspended Solids kg/day



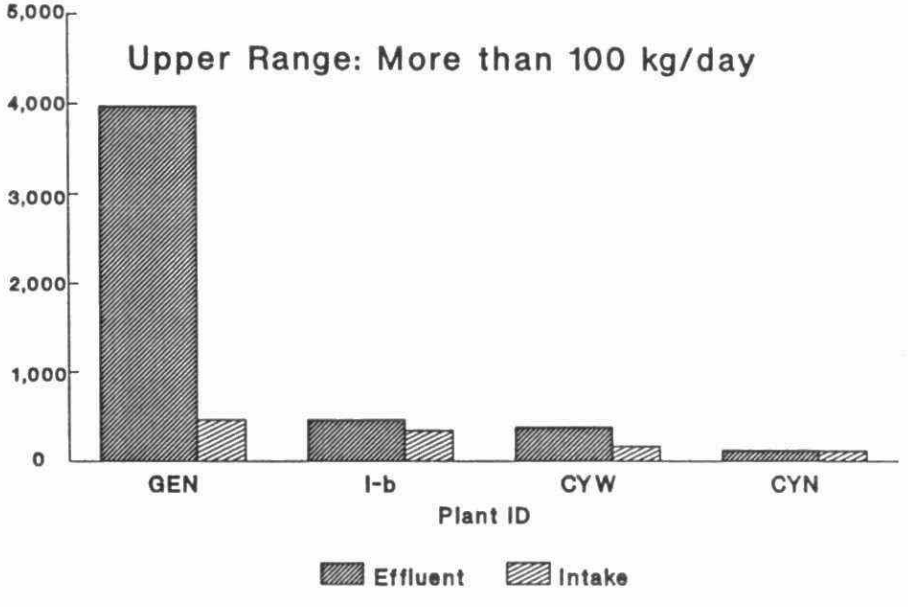


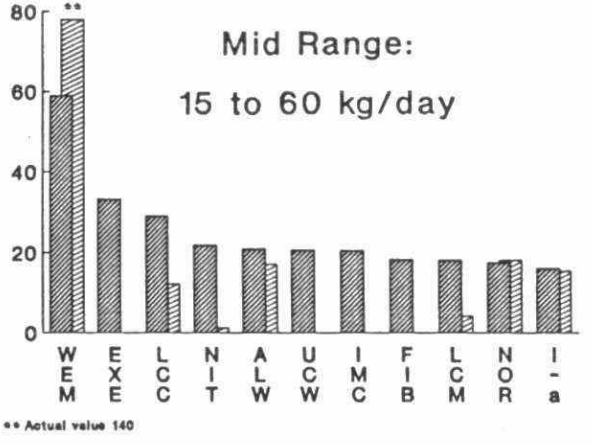


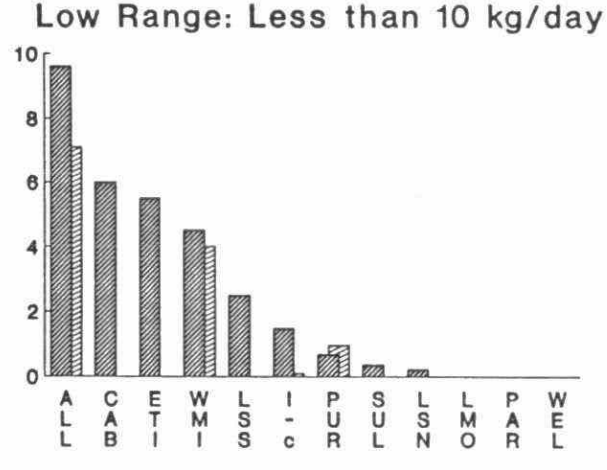
For plant codes and numerical data see table A-1.
**See footnote on page B-15 regarding this loading.

Figure A-2

Dissolved Organic Carbon kg/day



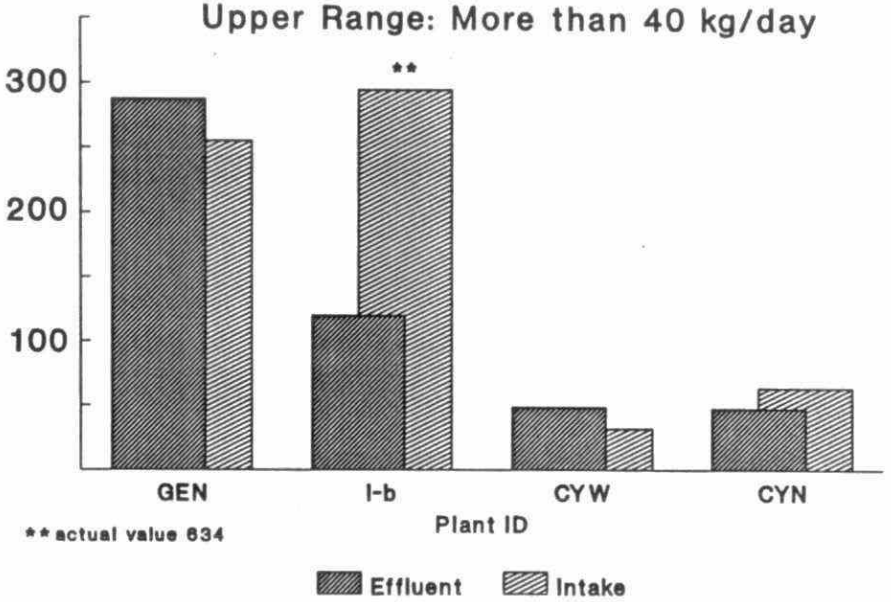


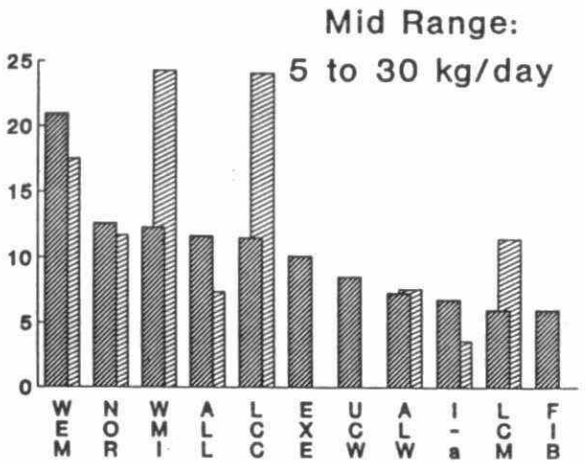


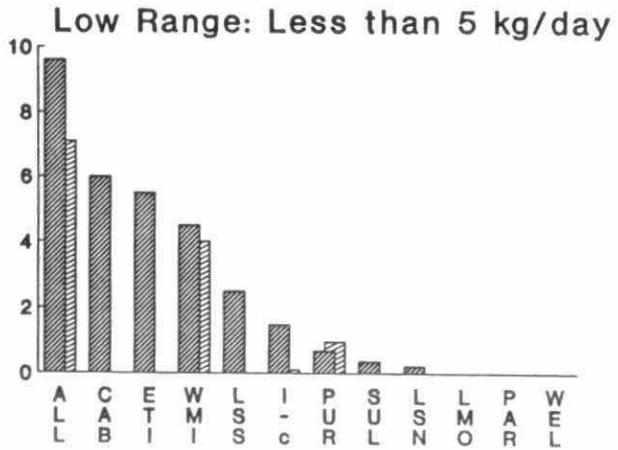
For plant codes and numerical data see table A-1.

Figure A-3

Oil and Grease
kg/day



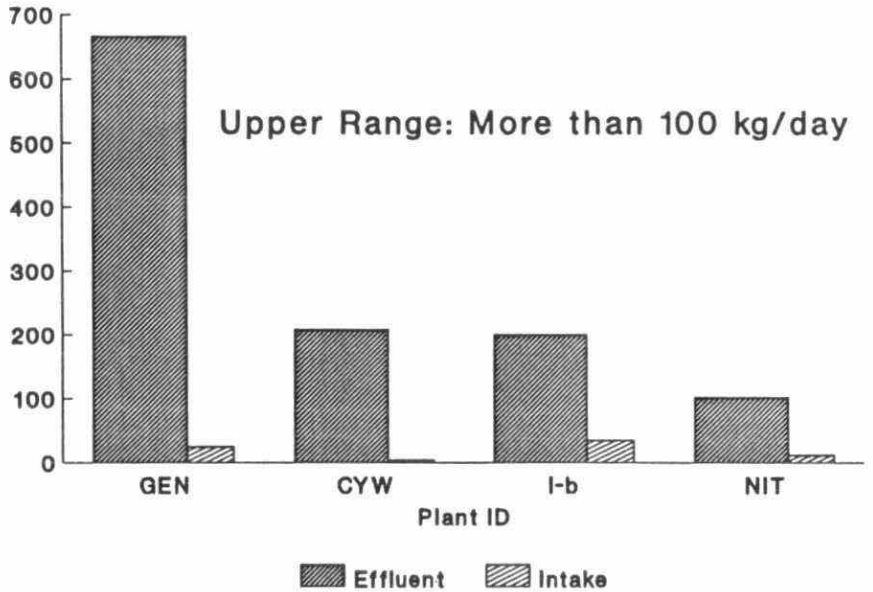


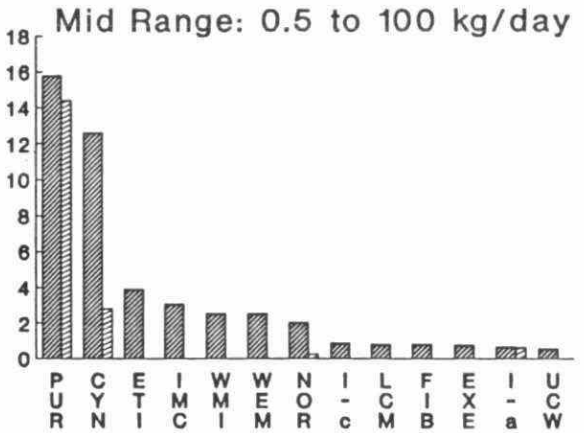


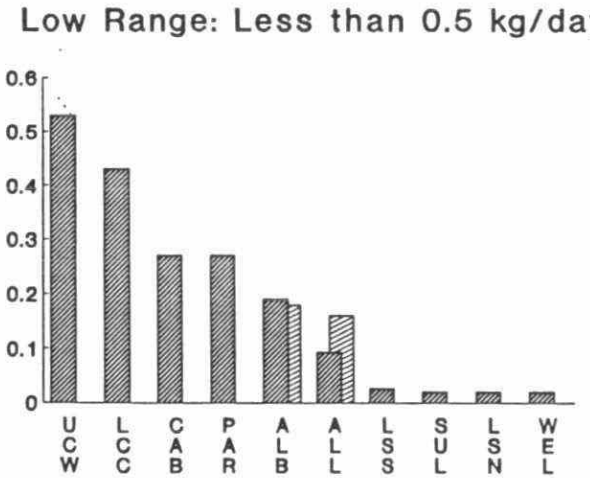
For plant codes and numerical data see table A-1.

Figure A-4

Ammonia and Ammonium Nitrogen kg/day



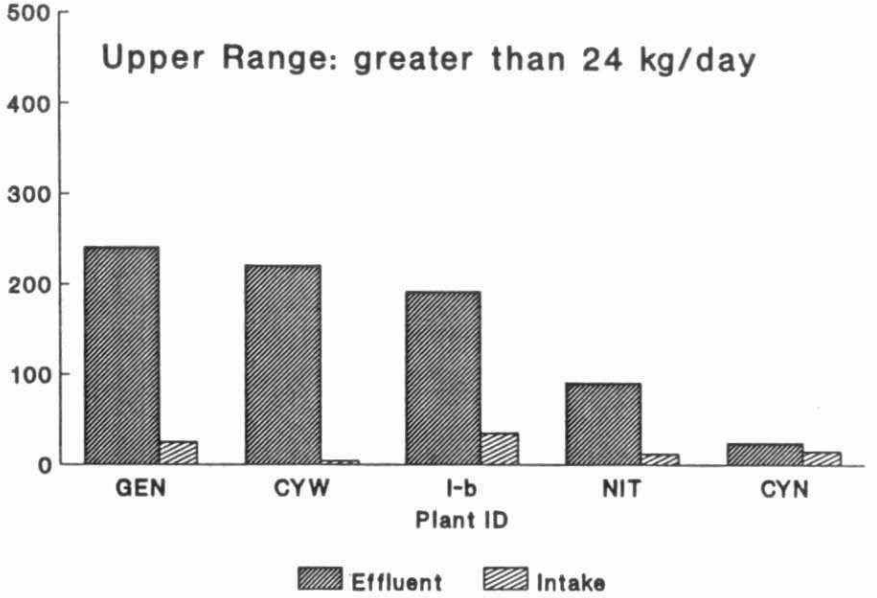




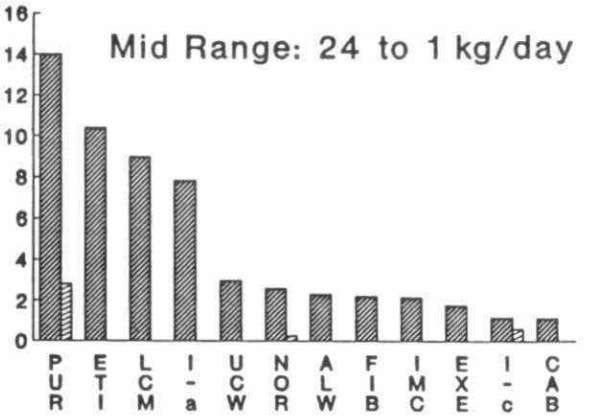
For plant codes and numerical data see table A-1.

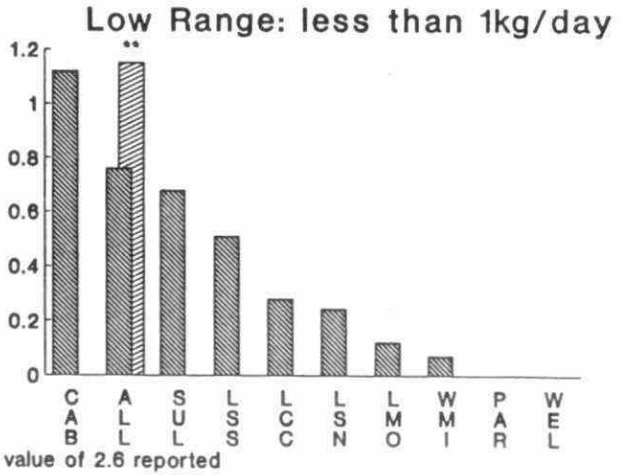
Figure A-5

Nitrate and Nitrite Nitrogen kg/day



For plant codes and numerical data see table A-1.

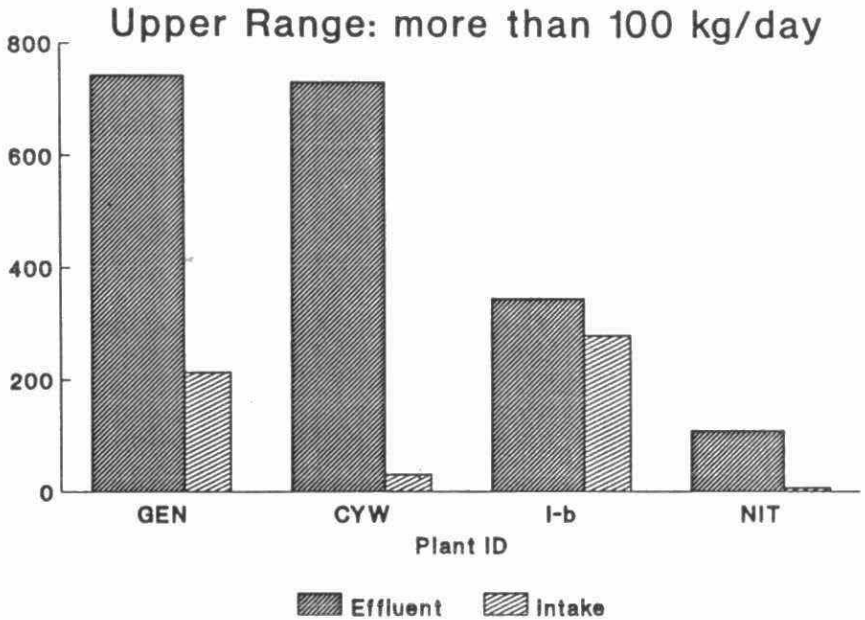




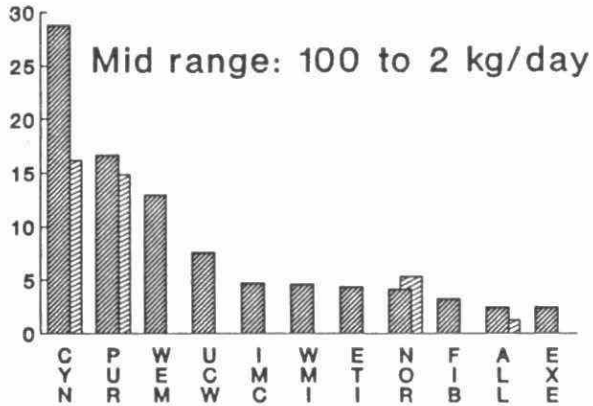
** value of 2.6 reported

Figure A-6

Kjeldahl Nitrogen kg/day



For plant codes and numerical data see table A-1.



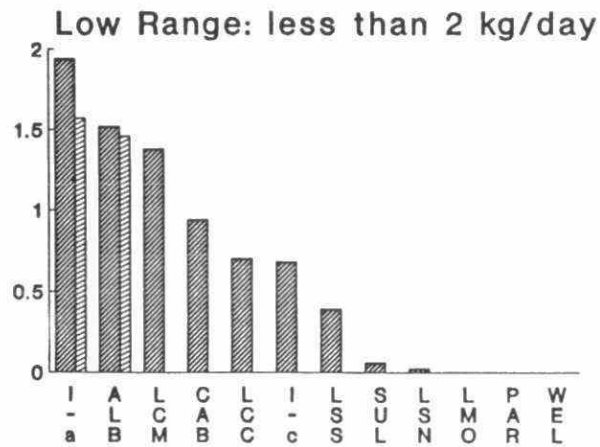
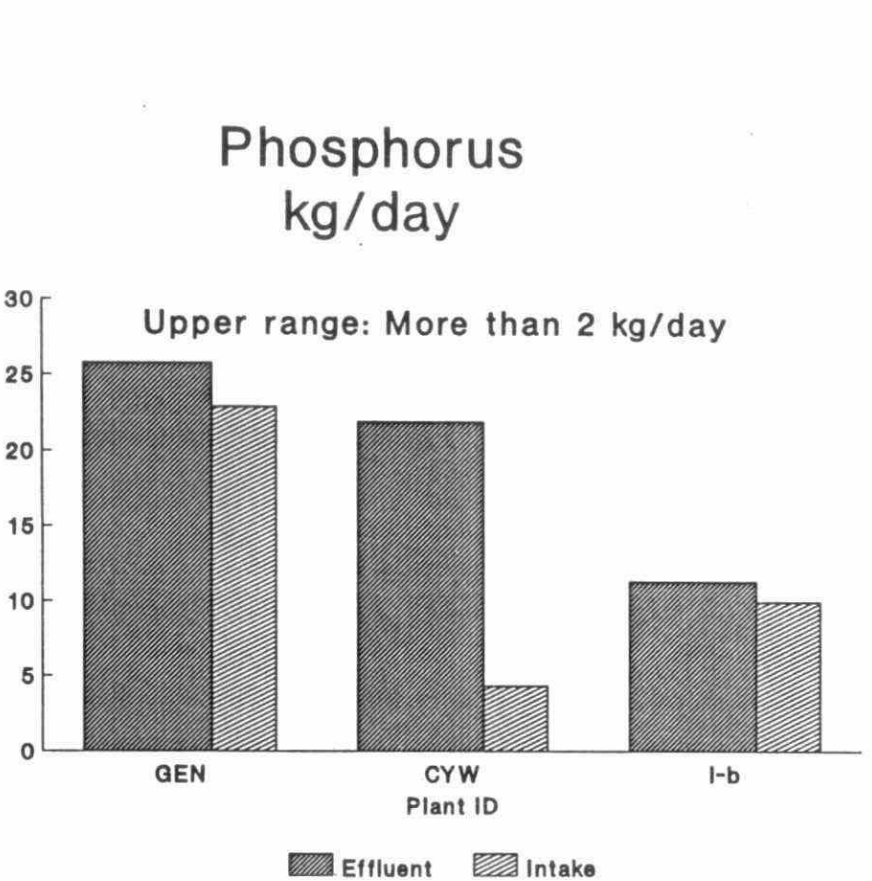
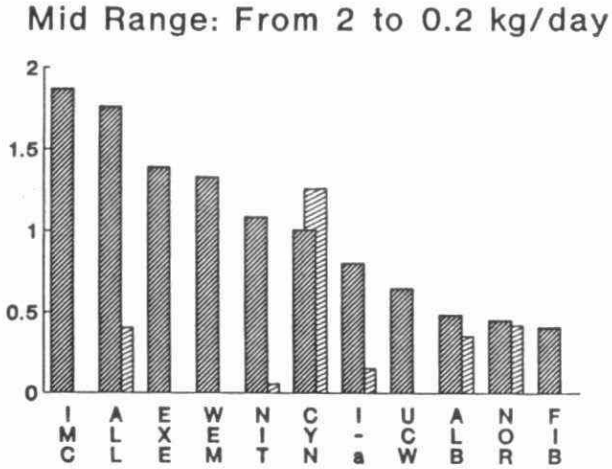


Figure A-7



For plant codes and numerical data see table A-1.

Figure A-8



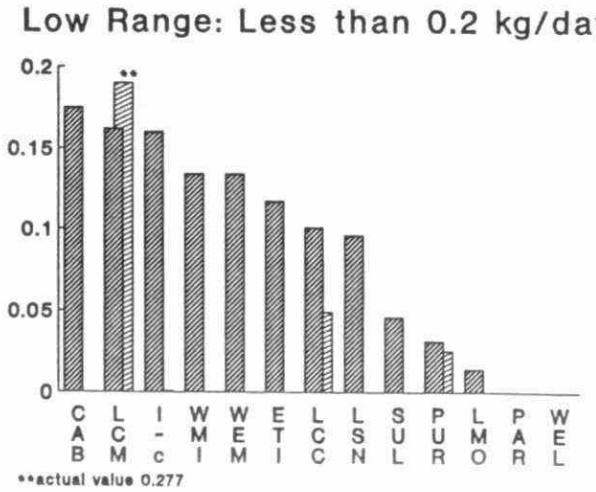


Table A–1 – Total Plant Flows and Loadings – Conventional Parameters.

Plant	Code	Flow	TSS	kg/day	DOC	kg/day	O&G	kg/day
		m3/d	effluent	intake	effluent	intake	effluent	intake
Albright and Wilson	ALB	6050	27	23	20.9	17	7.3	7.6
Allied Chemicals	ALL	3643	79	53	9.6	7.1	11.65	7.4
Cabot Canada	CAB	2180	10.9		6		3.1	
Cyanamid Niagara	CYN	36100	491	1060	118.4	112	47.4	63.2
Cyanamid Welland	CYW	29000	785	1590	375	162	48.5	31.8
ETI	ETI	885	13.5		5.5		1.3	
Exolon–ESK	EXE	9550	184		33.2		10.1	
Fiberglas	FIB	5470	238		18.2		6	
General Chemical	GEN	224000	6580	4080	3975	464	287	255
ICI Conpac	I–c	19.5	2	0.1	1.47	0.1		
ICI Cornwall	I–a	4010	197	20	16	15.3	6.8	3.6
ICI Courtright	I–b	171000	1130	1280	464	338	120	634
IMC	IMC	2860	22		20.5		3	
Linde Moore	LMO	4.8						
Linde Sarnia	LSN	20.5	0.215		0.217			
Linde Sault.	LSS	249	6.3		2.5		0.6	
Liq. Carb. Courtr.	LCC	4860	14	16	29.1	12.1	11.5	24.1
Liq. Carb. Maitl.	LCM	2180	2.8	2.4	18	4.15	6	11.4
Nitrochem	NIT	798	197	3.3	21.8	1.3	1.8	1.2
Norton	NOR	8580	118	87	17.4	18	12.6	11.7
Partek	PAR	31						
Puritan–Bennett	PUR	270	0.72	0.81	0.69	0.96	0.255	0.257
Sulco	SUL	68	0.74		0.36		0.16	
UCAR Carbon Welland	UCW	7040	30.3		20.6		8.5	
Washington El. Min.	WEM	17900	92	107	58.8	140	20.9	17.5
Washington Mills	WMI	2050	47	44	4.5	4	12.3	24.3
Welland Chemical	WEL	53	0.1					
SECTOR TOTALS		539000	10300		5240		627	

Notes: Sector totals shown make no allowance for intake levels.

See Section III of this report for important details on data interpretation.

Flow and loadings values are of conventional parameters leaving plant sites in effluent streams or present in intake water.

TSS indicates total suspended solids mean results, DOC dissolved organic carbon content and O&G non–polar solvent extractables.

Blanks indicate less than 0.1 kg/day or an absence of reported data.

Table A–1 – Total Plant Flows and Loadings – Conventional Parameters.

Plant	Code	Flow	NH3 N	kg/day	NOX ions	kg/day	TKN	kg/day	PO4 P	kg/day
		m3/d	effluent	intake	effluent	intake	effluent	intake	effluent	intake
Albright and Wilson	ALB	6050	0.19	0.18	2.3	2.15	1.52	1.46	0.484	0.351
Allied Chemicals	ALL	3643	0.093	0.16	0.76	2.5	2.47	1.25	1.76	0.403
Cabot Canada	CAB	2180	0.27		1.12		0.94		0.175	
Cyanamid Niagara	CYN	36100	12.6	2.8	24.1	17.3	28.8	16.2	1.01	1.26
Cyanamid Welland	CYW	29000	208	4	221	30.6	731	29.9	21.9	4.3
ETI	ETI	885	3.87		10.4		4.4		0.117	
Exolon–ESK	EXE	9550	0.76		1.76		2.44		1.39	
Fiberglas	FIB	5470	0.81		2.22		3.24		0.407	
General Chemical	GEN	224000	666	24.5	241	168	742	214	25.8	22.9
ICI Conpac	I–c	19.5	0.87		1.14		0.68		0.16	0.001
ICI Cornwall	I–a	4010	0.66	0.6	7.84	1.48	1.94	1.57	0.801	0.153
ICI Courtright	I–b	171000	200	35	192	83	345	279	11.3	9.92
IMC	IMC	2860	3.07		2.13		4.71		1.87	
Linde Moore	LMO	12			0.122				0.014	
Linde Sarnia	LSN	164	0.02		0.244		0.026		0.096	
Linde Sault.	LSS	249	0.026		0.51		0.39		0.268	
Liq. Carb. Courtr.	LCC	4860	0.43		0.28		0.7		0.101	0.049
Liq. Carb. Maitl.	LCM	2180	0.81		9		1.38		0.162	0.277
Nitrochem	NIT	798	102	11.9	90.2	18	108	6.15	1.09	0.055
Norton	NOR	8580	2.02	0.25	2.58	2.05	4.14	5.33	0.449	0.42
Partek	PAR	31								
Puritan–Bennett	PUR	270	15.8	14.4	14	9.29	16.7	14.9	0.031	0.025
Sulco	SUL	68	0.02		0.68		0.06		0.046	
UCAR Carbon Welland	UCW	7040	0.53		2.97		7.58		0.648	
Washington El. Min.	WEM	17900	0.66		3.1		13		1.33	
Washington Mills	WMI	2050	2.53		0.072		4.61		0.134	
Welland Chemical	WEL	53								
SECTOR TOTALS		539000	1220		832		203		71.5	

Notes: Sector totals shown do not allow for intake levels.

See Section III of this report for important details on data interpretation.

Flow and loadings values are of conventional parameters leaving plant sites in effluent streams or present in intake water.

NH3 N indicates ammonia and ammonium nitrogen mean loadings, NOX nitrite and nitrate nitrogen and TKN Kjeldahl nitrogen.

PO4 P is phosphorus loading present in phosphate salts.

Blanks indicate less than 0.001 kg or an absence of reported data.

APPENDIX B

Twelve-Month Average Concentration/Loading Tables by Individual Control Point

Explanatory Notes

Concentrations/Loadings Values:

- Numbers have been truncated to clarify the tables.
- All data have been rounded off to three figures.
- The concentrations are arithmetic mean values calculated over all validated data points, including statistical outliers and may therefore be an over-estimate of the typical values observed. The number of data points for a parameter may vary from 2 to 365.

  Generally conventional parameters (denoted with an ATG "c") and flow had the most data points with other ATG's at varying frequencies as per the Sector Regulation.
- " — " loading values represent less than one gram per day.
- Blank concentration/loading entries indicates that the parameter was not "found", not monitored or a loading value was not appropriate (e.g. flow, pH and specific conductance).

Flow Values:

- Flow values are reported as "Ftflow" or "Ftflav" parameters
- Batch discharges were reported as the total volume discharged over a 24 period.
- Units of flow are in cubic metres per 24 hour period of the monitoring day.

Albright & Wilson
Port Maitland

				CONCENTRATIONS		LOADINGS (kg/d)	
ATG	PARAMETER	RMDL	UNIT	CO 0100	IN 0400	CO 0100	IN 0400
c	Total suspended solids	5	mg/L	4.45	3.75	26.7	22.7
c	Hydrogen ion (pH)			7.96	7.76		
c	Specific conductance		uS/cm	327	305		
c	DOC	0.5	mg/L	3.39	2.82	20.9	17
c	TOC	5	mg/L	3.43	2.81	21.2	17
c	Oil and grease	1	mg/L	1.21	1.25	7.28	7.56
c	Ammonia plus Ammonium	0.25	mg/L	0.031	0.03	0.193	0.181
c	Nitrate+Nitrite	0.25	mg/L	0.37	0.355	2.3	2.15
c	Total Kjeldahl nitrogen	0.5	mg/L	0.242	0.241	1.52	1.46
c	Total phosphorus	0.1	mg/L	0.081	0.058	0.484	0.351
09	Aluminum	30	ug/L	583	504	3.52	3.05
09	Strontium	20	ug/L	181	175	1.12	1.06
09	Zinc	10	ug/L	7.33	12.7	0.046	0.077
12	Mercury	0.1	ug/L	0.126	0.099	0.001	0.001
14	Phenolics (4AAP)	2	ug/L	3.83	1.36	0.024	0.008
16	1,2-Dichloroethane	0.8	ug/L	0.665	0.665	0.005	0.004
16	Chloroform	0.7	ug/L	4.55	4.3	0.032	0.026
16	Dibromochloromethane	1.1	ug/L	3.05	3.15	0.023	0.019
16	Methylene chloride	1.3	ug/L	14	1.21	0.109	0.007
17	Benzene	0.5	ug/L	0.7	1.25	0.005	0.008
23	Hexachlorocyclopentadiene	10	ng/L	11.7	7.45	–	–
98	Ftflow		m3/d	6050			
I1	Chloride	2	mg/L	22.6	20	165	121
I2	Fluoride	0.1	mg/L	0.130	0.130	0.938	0.786
I3	Sulphate	5	mg/L	31.5	28.5	231	172

Notes:

CO0100 is the "Final Discharge to the River" which discharges into Lake Erie.

Intake loadings are based on reported concentrations and the mean discharge flow rate.

Allied Chemicals
Amherstburg

		CONCENTRATIONS						LOADINGS (kg/d)			
ATG	PARAMETER	RMDL	UNIT	PR 0100	PR 0300	PR 0600	IN 0800	PR 0100	PR 0300	PR 0600	IN 0800
c	Total suspended solids	5	mg/L	245	25.7	12	17.2	53.9	160	0.591	53.2
c	Hydrogen ion (pH)			8.75	7.89	2.45	8.04				
c	Specific conductance		uS/cm	3600	7600	361000	263				
c	DOC	0.5	mg/L	14.5	3.07	0.625	2.3	1.79	19.4	0.038	7.13
c	TOC	5	mg/L	22	7.94	2.63	3.33	2.85	50.8	0.156	10.3
c	Oil and grease	1	mg/L	2.93	3.68	2.35	2.38	0.629	23.5	0.086	7.37
c	Ammonia plus Ammonium	0.25	mg/L	0.149	0.029	0.175	0.05	0.022	0.187	0.01	0.155
c	Nitrate+Nitrite	0.25	mg/L	0.881	0.235	0.715	0.805	0.167	1.53	0.034	2.5
c	Total Kjeldahl nitrogen	0.5	mg/L	0.518	0.765	0.45	0.387	0.084	4.99	0.015	1.2
c	Total phosphorus	0.1	mg/L	0.057	0.549	0.04	0.13	0.015	3.55	0.003	0.404
09	Aluminum	30	ug/L	485	438	4860	391	0.102	2.88	0.099	1.21
09	Boron	50	ug/L	1810	3610	5100	767	0.431	23.7	0.329	2.38
09	Cadmium	2	ug/L	9.83	8.67	11.8	1.92	0.002	0.057	–	0.006
09	Chromium	20	ug/L	29.2	21.7	52.5	23.3	0.006	0.14	0.004	0.072
09	Copper	10	ug/L	15	12.8	17.5	13.3	0.003	0.081	0.001	0.041
09	Molybdenum	20	ug/L	67.5	165	62.5	20	0.016	1.05	0.004	0.062
09	Nickel	20	ug/L	26.7	178	32.5	20	0.005	1.14	0.002	0.062
09	Strontium	20	ug/L	607	14800	245	188	0.101	96.2	0.012	0.58
09	Zinc	10	ug/L	71	215	55	193	0.011	1.35	0.002	0.599
10	Antimony	5	ug/L	249	15.5	67.8		0.043	0.097	0.005	
10	Arsenic	5	ug/L	203	188	245		0.036	1.22	0.005	
10	Selenium	5	ug/L	2	2.75	4		–	0.017	–	
12	Mercury	0.1	ug/L	0.296	1.24	0.35	0.108	–	0.008	–	–
14	Phenolics (4AAP)	2	ug/L	5.98	94	43.3	2.583	0.001	0.624	0.003	0.008
16	1,1,2,2–Tetrachloroethane	4.3	ug/L	129	4.18	4230		0.019	0.027	0.184	
16	1,1,2–Trichloroethane	0.6	ug/L	125	2.7	2880		0.018	0.018	0.131	
16	1,1–Dichloroethane	0.8	ug/L	91.6	2.63	2470		0.013	0.017	0.100	
16	1,1–Dichloroethylene	2.8	ug/L	114	2.72	2740		0.016	0.018	0.121	
16	1,2–Dichlorobenzene	1.4	ug/L	246	6.73	6390		0.035	0.044	0.266	
16	1,2–Dichloroethane	0.8	ug/L	103	2.66	2610		0.015	0.017	0.111	
16	1,2–Dichloropropane	0.9	ug/L	91.6	2.64	2470		0.013	0.017	0.100	

Continued

Allied Chemicals
Amherstburg

		CONCENTRATIONS						LOADINGS (kg/d)			
ATG	PARAMETER	RMDL	UNIT	PR 0100	PR 0300	PR 0600	IN 0800	PR 0100	PR 0300	PR 0600	IN 0800
16	1,3–Dichlorobenzene	1.1	ug/L	286	7.9	7560		0.041	0.051	0.312	
16	1,4–Dichlorobenzene	1.7	ug/L	425	13	12000		0.061	0.084	0.472	
16	Bromoform	3.7	ug/L	114	2.76	2740		0.016	0.018	0.121	
16	Bromomethane	3.7	ug/L	1400	41.6	38800		0.201	0.268	1.55	
16	Carbon tetrachloride	1.3	ug/L	736	2.78	3130		0.106	0.018	0.195	
16	Chlorobenzene	0.7	ug/L	103	2.65	2610		0.015	0.017	0.111	
16	Chloroform	0.7	ug/L	4610	2.83	15500		0.792	0.018	0.991	
16	Chloromethane	3.7	ug/L	192	2.92	3680		0.027	0.019	0.191	
16	Cis–1,3–Dichloropropylene	1.4	ug/L	477	13.1	12600		0.067	0.085	0.523	
16	Dibromochloromethane	1.1	ug/L	136	2.85	3010		0.019	0.018	0.141	
16	Ethylene dibromide	1	ug/L	103	2.68	2610		0.015	0.017	0.111	
16	Methylene chloride	1.3	ug/L	389	14.8	18500	1.09	0.058	0.095	1.19	0.003
16	Tetrachloroethylene	1.1	ug/L	136	2.78	3010		0.019	0.018	0.141	
16	Trans–1,2–Dichloroethylene	1.4	ug/L	114	2.69	2740		0.016	0.017	0.121	
16	Trans–1,3–Dichloropropylene	1.4	ug/L	114	2.69	2740		0.016	0.017	0.121	
16	Trichloroethylene	1.9	ug/L	235	6.57	6250		0.034	0.042	0.256	
16	Trichlorofluoromethane	1	ug/L	1240	2.88	88700		0.219	0.019	5.51	
16	Vinyl chloride	4	ug/L	192	2.93	3680		0.027	0.019	0.191	
17	Benzene	0.5	ug/L	91.6	2.63	2470		0.013	0.017	0.100	
17	Styrene	0.5	ug/L	268	6.67	6660		0.038	0.043	0.286	
17	Toluene	0.5	ug/L	102	2.73	2360		0.016	0.018	0.144	
17	m–Xylene and p–Xylene	1.1	ug/L	103	2.65	2610		0.015	0.017	0.111	
17	o–Xylene	0.5	ug/L	136	2.73	3010		0.019	0.018	0.141	
18	Acrolein	4	ug/L	1110	13.4	29200		0.139	0.087	1.17	
18	Acrylonitrile	4.2	ug/L	577	6.8	15000		0.072	0.044	0.617	
19	Bis(2–ethylhexyl) phthalate	2.2	ug/L	15.9	65.1	14.1		0.003	0.410	0.001	
19	Di–n–butyl phthalate	3.8	ug/L	4.03	6.8	12.1		0.001	0.044	0.001	
23	1,2,3,4–Tetrachlorobenzene	10	ng/L	219	5	5210		–	–	–	
23	1,2,3,5–Tetrachlorobenzene	10	ng/L	185	5	5210		–	–	–	
23	1,2,3–Trichlorobenzene	10	ng/L	368	10	18400		–	–	0.001	
23	1,2,4,5–Tetrachlorobenzene	10	ng/L	185	5	5210		–	–	–	
23	1,2,4–Trichlorobenzene	10	ng/L	1080	10	10900		–	–	0.001	
23	2,4,5–Trichlorotoluene	10	ng/L	445	10	13400		–	–	0.001	
23	Hexachlorobenzene	10	ng/L	2030	1.75	1040		–	–	–	

Continued

Allied Chemicals
Amherstburg

		CONCENTRATIONS						LOADINGS (kg/d)			
ATG	PARAMETER	RMDL	UNIT	PR 0100	PR 0300	PR 0600	IN 0800	PR 0100	PR 0300	PR 0600	IN 0800
23	Hexachlorobutadiene	10	ng/L	205	5	5220		–	–	–	
23	Hexachlorocyclopentadiene	10	ng/L	325	6.25	5320		–	–	–	
23	Hexachloroethane	10	ng/L	1090	5	18400		–	–	0.001	
23	Octachlorostyrene	10	ng/L	92.8	1	1040		–	–	–	
23	Pentachlorobenzene	10	ng/L	183	5	5210		–	–	–	
24	2,3,7,8 TCDD	20	pg/L	12.5	12.7	17.5		–	–	–	
24	Octachlorodibenzo–p–dioxin	30	pg/L	197	33.2	133		–	–	–	
24	Octachlorodibenzofuran	30	pg/L	1780	31	29.8		–	–	–	
24	Total H7CDD	30	pg/L	30.3	24.5	29.3		–	–	–	
24	Total P5CDD	20	pg/L	14.7	20	17.5		–	–	–	
24	Total T4CDD	20	pg/L	17.5	31	25		–	–	–	
98	Ftflow		m3/d	207	6260	62.5					
I1	Chloride	2	mg/L	488	1770	110000	18.4	88.9	11200	7770	57
I2	Fluoride	0.1	mg/L	44.9	12.2	2940	10	5.98	76.8	158	2.41
I3	Sulphate	5	mg/L	54.8	2020	441		8.94	12700	25.9	

Notes:

Measurement of ATG 16 and 18 parameters required dilution before analysis which may result in high detection limits.
Values for ATG 16 and 18 parameters may therefore be higher than the actual amounts present.

Intake loadings have been calculated using reported concentration data and 3104 m3/day for flow rate.
This flow rate of 3104 m3/day is derived from 181 discharging days recorded for PR0300; i.e. 181/365 of PR0300 mean flow.

PR0100 is the "Effluent from the Genetron Collection Sump" and this is discharged to the Detroit River via General Chemical CO0100.
PR0300 is the "HF Bleed Effluent" which also discharged, on 181 days, to the Detroit River via General Chemical CO0100.
PR0600 is the effluent "Hydrochloric Acid Stream" which is used in calcium chloride manufacture with eventual water discharge to the Detroit River via General Chemical stream CO0200.

Cabot Canada
Sarnia

		CONCENTRATIONS			LOADINGS kg/d
ATG	PARAMETER	RMDL	UNIT	CO 0100	CO 0100
c	Total suspended solids	5	mg/L	4.89	10.9
c	Hydrogen ion (pH)			7.99	
c	Specific conductance		uS/cm	739	
c	DOC	0.5	mg/L	3.05	5.96
c	Oil and grease	1	mg/L	1.36	3.14
c	Ammonia plus Ammonium	0.25	mg/L	0.145	0.266
c	Nitrate+Nitrite	0.25	mg/L	0.605	1.12
c	Total Kjeldahl nitrogen	0.5	mg/L	0.51	0.936
c	Total phosphorus	0.1	mg/L	0.086	0.175
09	Aluminum	30	ug/L	661	1.39
09	Copper	10	ug/L	23.5	0.051
09	Strontium	20	ug/L	169	0.349
09	Zinc	10	ug/L	73.6	0.135
14	Phenolics (4AAP)	2	ug/L	1.5	0.004
15	Sulphide	20	ug/L	30	0.096
16	Chloroform	0.7	ug/L	1.1	0.005
18	Acrylonitrile	4.2	ug/L	4.2	0.017
23	Hexachlorocyclopentadiene	10	ng/L	7.35	–
2	Cyanide Total	0.005	mg/L	0.004	0.008
98	Ftflow		m3/d	2180	
I1	Chloride	2	mg/L	127	213
I2	Fluoride	0.1	mg/L	0.1	0.32
I3	Sulphate	5	mg/L	53	155

Notes:

CO0100 is the effluent stream "Discharge from Filter Bed".
This flows is discharged via the Cole Drain to the St. Clair River.

Cyanamid Canada

Niagara Falls
(Niagara Plant)

				CONCENTRATIONS					LOADINGS (kg/d)				
ATG	PARAMETER	RMDL	UNIT	CO 0100	CO 0200	CO 0500	CO 0600	IN 0400	CO 0100	CO 0200	CO 0500	CO 0600	IN 0400
c	Total suspended solids	5	mg/L	14.6	11.6	38.7	19.7	29.3	266	215	268	18.9	1060
c	Hydrogen ion (pH)			8.49	8.32	8.44	8.65	8.19					
c	Specific conductance		uS/cm	350	273	296	432	289					
c	DOC	0.5	mg/L	4.15	3.27	2.36	2.87	3.09	78	58.3	39.6	2.62	112
c	TOC	5	mg/L	3.97	2.98	3.33	4.01	2.74	71	52.2	57.8	3.88	98.9
c	Oil and grease	1	mg/L	1.28	1.48	1.01	1.39	1.75	25.4	25.3	17.6	1.21	63.2
c	Ammonia plus Ammonium	0.25	mg/L	0.618	0.223	0.49	0.38	0.078	10.2	3.84	6.95	0.368	2.82
c	Nitrate+Nitrite	0.25	mg/L	0.69	0.587	0.658	3.57	0.478	13.7	10.1	10.7	3.55	17.3
c	Total Kjeldahl nitrogen	0.5	mg/L	0.986	0.667	1.13	1.25	0.45	16.3	11.7	16.8	1.18	16.2
c	Total phosphorus	0.1	mg/L	0.049	0.028	0.018	0.025	0.035	0.821	0.449	0.277	0.021	1.26
09	Aluminum	30	ug/L	278	232	201	166	151	4.62	4.01	3.05	0.164	5.45
09	Strontium	20	ug/L	172	146	147	169	144	2.9	2.55	2.55	0.141	5.2
09	Zinc	10	ug/L	20.4	17.3	22.1	51.9	17.6	0.344	0.315	0.15	0.055	0.635
14	Phenolics (4AAP)	2	ug/L	1.4	1.5	2	2	1.64	0.024	0.026	0.026	0.002	0.0592
15	Sulphide	20	ug/L	20	40	40	40	30	0.364	0.691	0.843	0.036	1.08
2	Cyanide Total	0.005	mg/L	0.095	0.017	0.025	0.09	0.001	1.78	0.288	0.295	0.085	0.0361
98	Flow, Average		m3/d	18100	17700	17800	924						
I1	Chloride	2	mg/L	30	18.5	16	31	15	546	320	337	28.1	542
I2	Fluoride	0.1	mg/L	0.2	0.1	0.1	0.1	0.1	3.64	1.73	2.11	0.1	0.2
I3	Sulphate	5	mg/L	33	25	21	30	23.5	600	432	443	27.2	848

Notes:

Intake loadings have been calculated using the CO0200 flow average and half the sum of the other effluent stream flows.

CO0100 is the "Final Effluent to Whitty Creek"; discontinued from May/'90.
CO0200 is the "Effluent to the Hydro Canal".
CO0500 and CO0600 are the "Cooling Pond Overflow" and the "South Fork Effluent"
0500 and 0600 together replaced 0100 as monitoring points.

All discharges flow to Lake Ontario via local watercourses.

Cyanamid
Niagara Falls
(Welland Plant)

		CONCENTRATIONS						LOADINGS kg/d			
ATG	PARAMETER	RMDL	UNIT	CO0200	CO0400	OT0300	IN1500	CO0200	CO0400	OT0300	IN1500
c	Total suspended solids	5	mg/L	18.2	32.7	34.1	54.8	703	255	82.4	1590
c	Hydrogen ion (pH)			6.74	8.1	8.01	7.92				
c	Specific conductance		uS/cm	512	600	339	328				
c	DOC	0.5	mg/L	15.6	28.5	5.76	5.6	360	117	15.2	162
c	TOC	5	mg/L	15.5	29.4		7.9	367	104		229
c	Oil and grease	1	mg/L	2.01	1.47	1.017	1.1	45.7	8.65	2.81	31.8
c	Ammonia plus Ammonium	0.25	mg/L	8.16	16.8		0.137	208	57.4		3.97
c	Nitrate+Nitrite	0.25	mg/L	7.21	13.7		1.06	221	69.7		30.6
c	Total Kjeldahl nitrogen	0.5	mg/L	29.1	64.1		1.03	731	258		29.9
c	Total phosphorus	0.1	mg/L	0.846	2.63	0.091	0.149	21.7	10.6	0.228	4.32
09	Aluminum	30	ug/L	788	1130		1970	29.5	7.97		57
09	Strontium	20	ug/L	234	239		285	5.54	1.34		8.26
09	Zinc	10	ug/L	14.3	11.6		9	0.381	0.09		0.261
10	Antimony	5	ug/L	5.17	5.21		4	0.103	0.019		0.116
10	Arsenic	5	ug/L	2.88	5.79		3	0.064	0.024		0.087
12	Mercury	0.1	ug/L	0.148	0.018		0.66	0.003	–		0.019
14	Phenolics (4AAP)	2	ug/L	2.58	2.67		2.5	0.064	0.021		0.072
15	Sulphide	20	ug/L	69.5	37.3		34.5	1.89	0.223		1
17	Toluene	0.5	ug/L	0.592	2.11		0.4	0.013	0.012		0.012
23	Hexachloroethane	10	ng/L	1.35	16.3		30.9	–	–		0.001
24	Octachlorodibenzo–p–dioxin	30	pg/L	225	90		290	–	–		–
2	Cyanide Total	0.005	mg/L	0.097	0.204		0.002	2.4	1.05		0.058
98	Ftflow		m3/d	26200	7380	2770					
I1	Chloride	2	mg/L	34	46		22	892	306		638
I2	Fluoride	0.1	mg/L	0.350	0.425		0.150	9.14	2.65		4.35
I3	Sulphate	5	mg/L	108	107		42.5	2810	651		1230

Notes:

CO0200 is the "Millers Creek final discharge" and this joins the Welland River.
CO0400 is the stream named "Sludge Pond #11"; this discharges into CO0200.
OT1300 is the "DICY Cooling Water" stream which also flows into the Welland River.

Intake loadings are calculated from the reported analytical data and the sum of CO0200 and OT1300 flows.
These intake loadings represent probable upper bounds because of rainfall contributions to the flow.

ETI
North Bay

		CONCENTRATIONS			LOADINGS kg/d
ATG	PARAMETER	RMDL	UNIT	OT 0100	OT 0100
c	Total suspended solids	5	mg/L	11.8	13.5
c	Hydrogen ion (pH)			7.29	
c	Specific conductance		uS/cm	274	
c	DOC	0.5	mg/L	6.76	5.46
c	TOC	5	mg/L	6.73	8.66
c	Oil and grease	1	mg/L	1.49	1.28
c	Ammonia plus Ammonium	0.25	mg/L	4.46	3.87
c	Nitrate+Nitrite	0.25	mg/L	9.38	10.4
c	Total Kjeldahl nitrogen	0.5	mg/L	5.18	4.43
c	Total phosphorus	0.1	mg/L	0.162	0.117
09	Aluminum	30	ug/L	1320	1.2
09	Strontium	20	ug/L	54.5	0.048
09	Zinc	10	ug/L	36.8	0.042
98	Ftflow		m3/d	885	

Notes:

OT0100 is the effluent stream "Discharge at Weir" and this flows to Lake Nipissing.

Exolon–Esk
Thorold

		CONCENTRATIONS			LOADINGS kg/d
ATG	PARAMETER	RMDL	UNIT	CO 0100	CO 0100
c	Total suspended solids	5	mg/L	19	184
c	Hydrogen ion (pH)			8.31	
c	Specific conductance		uS/cm	303	
c	DOC	0.5	mg/L	3.3	33.2
c	TOC	5	mg/L	4.03	41
c	Oil and grease	1	mg/L	1.07	10.1
c	Ammonia plus Ammonium	0.25	mg/L	0.08	0.762
c	Nitrate+Nitrite	0.25	mg/L	0.187	1.76
c	Total Kjeldahl nitrogen	0.5	mg/L	0.25	2.44
c	Total phosphorus	0.1	mg/L	0.137	1.39
09	Aluminum	30	ug/L	284	2.74
09	Copper	10	ug/L	9.39	0.093
09	Strontium	20	ug/L	156	1.5
14	Phenolics (4AAP)	2	ug/L	2	0.019
15	Sulphide	20	ug/L	55	0.531
17	Benzene	0.5	ug/L	0.485	0.005
17	Toluene	0.5	ug/L	1.55	0.016
2	Cyanide Total	0.005	mg/L	0.004	0.038
98	Ftflow		m3/d	9550	
I1	Chloride	2	mg/L	18	174
I2	Fluoride	0.1	mg/L	0.15	1.47
I3	Sulphate	5	mg/L	30.5	295

Notes:

CO0100 is the effluent stream " 24" Outfall at Beaver–dam Road".
This stream flows to Lake Gibson and then to Lake Ontario.

Fiberglas
Sarnia

		CONCENTRATIONS			LOADINGS kg/d
ATG	PARAMETER	RMDL	UNIT	CO 0100	CO 0100
c	Total suspended solids	5	mg/L	39.2	238
c	Hydrogen ion (pH)			8	
c	Specific conductance		uS/cm	253	
c	DOC	0.5	mg/L	3.19	18.2
c	TOC	5	mg/L	4.07	24.1
c	Oil and grease	1	mg/L	1.2	6.05
c	Ammonia plus Ammonium	0.25	mg/L	0.156	0.815
c	Nitrate+Nitrite	0.25	mg/L	0.422	2.22
c	Total Kjeldahl nitrogen	0.5	mg/L	0.606	3.24
c	Total phosphorus	0.1	mg/L	0.075	0.407
09	Aluminum	30	ug/L	139	0.821
09	Boron	50	ug/L	373	1.91
09	Strontium	20	ug/L	86	0.486
09	Zinc	10	ug/L	8.17	0.043
12	Mercury	0.1	ug/L	0.115	0.001
14	Phenolics (4AAP)	2	ug/L	4.37	0.024
15	Sulphide	20	ug/L	35	0.192
17	Benzene	0.5	ug/L	1.35	0.008
2	Cyanide Total	0.005	mg/L	0.004	0.023
98	Ftflow		m3/d	5470	
I1	Chloride	2	mg/L	8.4	49.3
I2	Fluoride	0.1	mg/L	0.1	0.577
I3	Sulphate	5	mg/L	16	92.2

Notes:

CO0100 is the main site effluent stream "Main Effluent to Cole Drain".
This stream reaches the StClair River via the Cole Drain.
Considerable catchment of runoff augmented the flow during precipitation.

General Chemical
Amherstburg

		CONCENTRATIONS					LOADINGS kg/d		
ATG	PARAMETER	RMDL	UNIT	CO 0100	CO 0200	IN 0600	CO 0100	CO 0200	IN 0600
c	Total suspended solids	5	mg/L	41.4	28.2	18.2	629	5950	4080
c	Hydrogen ion (pH)			11.5	8.22	8.16			
c	Specific conductance		uS/cm	59200	573	271			
c	DOC	0.5	mg/L	221	2.19	2.07	3530	445	464
c	TOC	5	mg/L	321	2.48	2.31	5080	504	518
c	Oil and grease	1	mg/L	1.4	1.29	1.14	21.9	265	255
c	Ammonia plus Ammonium	0.25	mg/L	5.44	2.97	0.109	80.1	586	24.5
c	Nitrate+Nitrite	0.25	mg/L	0.831	1.15	0.747	13.2	228	168
c	Total Kjeldahl nitrogen	0.5	mg/L	5.87	3.28	0.952	90	652	214
c	Total phosphorus	0.1	mg/L	0.237	0.11	0.102	3.42	22.4	22.9
09	Aluminum	30	ug/L	168	475	496	2.81	98	111
09	Beryllium	10	ug/L	10	10	10	0.161	2.08	2.24
09	Boron	50	ug/L	509	80.8	60.8	8.19	16.2	13.6
09	Cadmium	2	ug/L	11.3	2.17	2	0.23	0.445	0.449
09	Chromium	20	ug/L	115	19.2	20	2.32	4	4.49
09	Cobalt	20	ug/L	114	20	20	2.33	4.15	4.49
09	Copper	10	ug/L	66.7	10	10	1.29	2.08	2.24
09	Lead	30	ug/L	232	30	32.5	4.44	6.22	7.29
09	Molybdenum	20	ug/L	167	20	20	3.22	4.15	4.49
09	Nickel	20	ug/L	69.2	10	10	1.38	2.08	2.24
09	Strontium	20	ug/L	4910	137	123	79.9	28.1	27.5
09	Thallium	30	ug/L	52.5	30	30	0.818	6.22	6.73
09	Vanadium	30	ug/L	30.8	20	20	0.477	4.15	4.49
09	Zinc	10	ug/L	55	10.8	73.3	1.12	2.23	16.5
10	Antimony	5	ug/L	2		2	0.032		0.449
10	Arsenic	5	ug/L	18.7		2	0.297		0.449
10	Selenium	5	ug/L	2.42		2	0.04		0.449
12	Mercury	0.1	ug/L	0.203	0.117	0.101	0.003	0.024	0.023
14	Phenolics (4AAP)	2	ug/L	2.53	2.79	1.21	0.038	0.561	0.271
15	Sulphide	20	ug/L	50.1	23.1	10	0.731	4.42	2.24
16	1,1,2,2-Tetrachloroethane	4.3	ug/L	4.33	1	1	0.071	0.206	0.224
16	1,1,2-Trichloroethane	0.6	ug/L	1.29	0.35	0.325	0.022	0.068	0.073
16	1,1-Dichloroethane	0.8	ug/L	0.867	0.2	0.2	0.014	0.041	0.045
16	1,2-Dichloroethane	0.8	ug/L	0.867	0.2	0.2	0.014	0.041	0.045
16	1,2-Dichloropropane	0.9	ug/L	0.867	0.2	0.2	0.014	0.041	0.045
16	Bromoform	3.7	ug/L	8.67	2	2	0.142	0.412	0.449
16	Bromomethane	3.7	ug/L	8.67	2	2	0.142	0.412	0.449

Continued

General Chemical
Amherstburg

		CONCENTRATIONS					LOADINGS kg/d		
ATG	PARAMETER	RMDL	UNIT	CO 0100	CO 0200	IN 0600	CO 0100	CO 0200	IN 0600
16	Chloroform	0.7	ug/L	2.23	1.1	0.2	0.04	0.213	0.045
16	Chloromethane	3.7	ug/L	8.67	2	2	0.142	0.412	0.449
16	Cis-1,3-Dichloropropylene	1.4	ug/L	2.17	0.5	0.5	0.036	0.103	0.112
16	Dibromochloromethane	1.1	ug/L	4.33	1	1	0.071	0.206	0.224
16	Ethylene dibromide	1	ug/L	4.33	1	1	0.071	0.206	0.224
16	Methylene chloride	1.3	ug/L	2.88	0.75	0.708	0.048	0.148	0.159
16	Tetrachloroethylene	1.1	ug/L	2.17	0.5	0.55	0.036	0.103	0.123
16	Trans-1,3-Dichloropropylene	1.4	ug/L	2.17	0.5	0.5	0.036	0.103	0.112
16	Trichlorofluoromethane	1	ug/L	13.5	1.05	1	0.242	0.218	0.224
16	Vinyl chloride	4	ug/L	8.67	2	2	0.142	0.412	0.449
17	Benzene	0.5	ug/L	0.5	0.15	0.1	0.01	0.029	0.022
17	Styrene	0.5	ug/L	1	0.2	0.2	0.021	0.041	0.045
17	Toluene	0.5	ug/L	1	0.2	0.2	0.021	0.041	0.045
17	o-Xylene	0.5	ug/L	1	0.2	0.2	0.021	0.041	0.045
18	Acrolein	4	ug/L	20	4	4	0.419	0.824	0.897
18	Acrylonitrile	4.2	ug/L	10	2	2	0.209	0.412	0.449
19	Fluoranthene	0.4	ug/L	0.4	0.5	0.4	0.008	0.1	0.09
19	Phenanthrene	0.4	ug/L	0.4	0.65	0.4	0.008	0.128	0.09
19	Pyrene	0.4	ug/L	0.4	0.45	0.4	0.008	0.092	0.09
24	Octachlorodibenzo-p-dioxin	30	pg/L	67	165	115	–	–	–
24	Total H6CDD	30	pg/L	19	32.5	20.5	–	–	–
24	Total H6CDF	20	pg/L	20	56.5	20	–	–	–
24	Total H7CDD	30	pg/L	21	32	23	–	–	–
24	Total P5CDD	20	pg/L	20	33.5	28	–	–	–
24	Total P5CDF	15	pg/L	13	130	13	–	–	–
24	Total T4CDF	15	pg/L	10	275	10	–	–	–
2	Cyanide Total	0.005	mg/L	0.007	0.012	0.005	0.103	2.43	1.12
98	Ftflow		m3/d	15300	209000				
I1	Chloride	2	mg/L	47900	99.1	16.2	730000	19800	3640
I2	Fluoride	0.1	mg/L	2.17	0.111	0.106	33.8	22.9	23.8
I3	Sulphate	5	mg/L	1160	23.2	21.5	17800	4710	4810

Notes are provided on the next page

Continued

Notes:

CO0100 is the "North Drain Effluent" which discharges into the Detroit River.
CO0200 is the "Main Drain Effluent' which also flows to the River.

Intake loadings are based on freshwater intake analyses and on the sum of mean discharge flows from 0100 and 0200.
These intake loading values are probable upper bounds of the actual intake loadings due to rainfall flow contributions from the large catchment area of the plant.

Flow and loading values for CO0200 should be interpreted with caution.
A flow monitor employing depth sensing only without a purpose designed primary device was used.
The accuracy of this flow measurement method was estimated but not rigorously established or measured.

TSS values for CO0100 may be lower than indicated.
This is because metal carbonates slowly precipitate from samples during regular sampling and storage time before analysis.
Grab samples which are immediately analysed for TSS show up to 50% reductions.

The high chlorides content of stream CO0100 may have affected analyses performed for other parameters.
In particular measurement of ATG 9, 16, 17 and 18 parameters required dilution before analysis which may result in high detection limits
Values shown for ATG 9, 16, 17 and 18 parameters may therefore be higher than the actual amounts present .

TOC and DOC values displayed for CO0100 may also have been affected by chlorides and may be higher than the actual levels.

ICI
Cornwall
Conpac Plant

		CONCENTRATIONS				LOADINGS kg/d	
ATG	PARAMETER	RMDL	UNIT	BA 0100	IN 0300	BA 0100	IN 0300
c	Total suspended solids	5	mg/L	83.4	4.9	3.2	0.154
c	Hydrogen ion (pH)			7.13	7.95		
c	Specific conductance		uS/cm	4900	229		
c	DOC	0.5	mg/L	52.1	3.8	2.36	0.119
c	TOC	5	mg/L	56.8		2.53	
c	Oil and grease	1	mg/L	2.88	0.9	0.099	0.028
c	Ammonia plus Ammonium	0.25	mg/L	49.5	0.15	1.41	0.005
c	Nitrate+Nitrite	0.25	mg/L	56.9	0.368	1.83	0.012
c	Total Kjeldahl nitrogen	0.5	mg/L	34.9	0.391	1.09	0.012
c	Total phosphorus	0.1	mg/L	6.63	0.038	0.252	0.001
09	Aluminum	30	ug/L	379	80.8	0.014	0.003
09	Beryllium	10	ug/L	5.82	12.2	–	–
09	Boron	50	ug/L	149		0.006	
09	Cadmium	2	ug/L	24	9	0.001	–
09	Chromium	20	ug/L	75.8	18	0.003	0.001
09	Copper	10	ug/L	679	16.9	0.027	0.001
09	Lead	30	ug/L	728	21.7	0.028	0.001
09	Molybdenum	20	ug/L	9.23	32	–	0.001
09	Nickel	20	ug/L	239	13.2	0.009	–
09	Strontium	20	ug/L	288		0.007	
09	Thallium	30	ug/L	36.2	33	0.001	0.001
09	Vanadium	30	ug/L	10.2	67	–	0.002
09	Zinc	10	ug/L	187	14.5	0.007	–
10	Antimony	5	ug/L	3.42	2	–	–
10	Arsenic	5	ug/L	6.15	3	–	–
10	Selenium	5	ug/L	13.8	2	–	–
11	Chromium (hexavalent)	10	ug/L	10.1		–	
12	Mercury	0.1	ug/L	3.15	0.354	–	–
14	Phenolics (4AAP)	2	ug/L	10.4	2.39	–	–
16	Carbon tetrachloride	1.3	ug/L	27.9	0.367	0.001	–
16	Chloroform	0.7	ug/L	49.4	7.81	0.002	–
16	Dibromochloromethane	1.1	ug/L	2.86	0.933	–	–
16	Tetrachloroethylene	1.1	ug/L	2.55	0.4	–	–
17	Benzene	0.5	ug/L	1.69	0.14	–	–
17	Toluene	0.5	ug/L	2.92	0.128	–	–
17	m–Xylene and p–Xylene	1.1	ug/L	1.71	0.204	–	–
17	o–Xylene	0.5	ug/L	0.865	0.292	–	–
19	Benzylbutylphthalate	0.6	ug/L	0.74		–	
19	Bis(2–ethylhexyl) phthalate	2.2	ug/L	10.7		–	
19	Di–n–butyl phthalate	3.8	ug/L	9.15		–	
23	1,2,3,4–Tetrachlorobenzene	10	ng/L	37.5	10	–	–
23	1,2,3,5–Tetrachlorobenzene	10	ng/L	10.3	3	–	–
23	1,2,3–Trichlorobenzene	10	ng/L	52.1	11.3	–	–
23	1,2,4,5–Tetrachlorobenzene	10	ng/L	20.8	3	–	–
23	1,2,4–Trichlorobenzene	10	ng/L	47.4	3	–	–
23	2,4,5–Trichlorotoluene	10	ng/L	39.7	3	–	–
23	Hexachlorobenzene	10	ng/L	404	3	–	–
23	Hexachlorobutadiene	10	ng/L	42.5	5	–	–
23	Hexachlorocyclopentadiene	10	ng/L	18.6	17	–	–
23	Hexachloroethane	10	ng/L	1690	3.17	–	–
23	Octachlorostyrene	10	ng/L	17.2	6.92	–	–
23	Pentachlorobenzene	10	ng/L	35.3	4	–	–
24	Octachlorodibenzo–p–dioxin	30	pg/L	293		–	
24	Octachlorodibenzofuran	30	pg/L	118		–	
27	PCBT	0.1	ug/L	0.075		–	
98	Ftflow		m3/d	31.4			
I1	Chloride	2	mg/L	1380	22.5	50.2	0.706
I2	Fluoride	0.1	mg/L	1.94		0.044	
I3	Sulphate	5	mg/L	982	26	35.5	0.817

Notes

BA0100 is the "Effluent from Conpac" which is discharged into the St. Lawrence River.

ICI Canada
Cornwall

		CONCENTRATIONS					LOADINGS kg/d		
ATG	PARAMETER	RMDL	UNIT	PR 0400	CO 0300	IN 0200	PR 0400	CO 0300	IN 0200
c	Total suspended solids	5	mg/L	603	47.7	4.9	153	197	19.7
c	Hydrogen ion (pH)			8.76	7.9	7.95			
c	Specific conductance		uS/cm	19700	3050	229			
c	DOC	0.5	mg/L	11.7	3.89	3.8	2.42	16	15.3
c	TOC	5	mg/L	14.2	5.23	0.5	3.06	22.4	2.01
c	Oil and grease	1	mg/L	9.15	1.75	0.9	1.9	6.76	3.61
c	Ammonia plus Ammonium	0.25	mg/L	0.123	0.155	0.15	0.025	0.66	0.602
c	Nitrate+Nitrite	0.25	mg/L	0.444	1.98	0.368	0.094	7.84	1.48
c	Total Kjeldahl nitrogen	0.5	mg/L	0.52	0.468	0.391	0.115	1.94	1.57
c	Total phosphorus	0.1	mg/L	0.715	0.2	0.038	0.163	0.801	0.153
09	Aluminum	30	ug/L	505	147	80.8	0.103	0.634	0.324
09	Beryllium	10	ug/L	8.32	2.73	12.2	0.001	0.01	0.049
09	Boron	50	ug/L	735	227		0.156	0.997	
09	Cadmium	2	ug/L	1.18	8.32	9	–	0.032	0.036
09	Chromium	20	ug/L	25.8	20.8	19.1	0.004	0.079	0.077
09	Cobalt	20	ug/L	15.9	5.87	18.5	0.002	0.023	0.074
09	Copper	10	ug/L	26.4	20.1	16.9	0.005	0.082	0.068
09	Lead	30	ug/L	150	47.2	21.7	0.036	0.178	0.087
09	Molybdenum	20	ug/L	22.2	11.6	32	0.004	0.046	0.128
09	Nickel	20	ug/L	26	9.69	13.2	0.005	0.037	0.053
09	Strontium	20	ug/L	3860	3240		1.03	14.3	
09	Thallium	30	ug/L	38.8	22.1	33	0.008	0.097	0.132
09	Vanadium	30	ug/L	67.7	22	67	0.019	0.106	0.269
09	Zinc	10	ug/L	97	29.2	14.5	0.020	0.111	0.058
10	Arsenic	5	ug/L	7.5	2.79	3	0.002	0.012	0.012
11	Chromium (hexavalent)	10	ug/L	10	8.3		0.002	0.032	
12	Mercury	0.1	ug/L	139	16.8	0.354	0.021	0.063	0.001
14	Phenolics (4AAP)	2	ug/L	4.54	3.64	2.39	0.001	0.014	0.01
15	Sulphide	20	ug/L	11.3	215	10	0.003	0.79	0.04
16	1,2-Dichloroethane	0.8	ug/L	0.995	0.563	0.517	–	0.002	0.002
16	Chloroform	0.7	ug/L	19.3	10.6	7.81	0.004	0.044	0.031
16	Dibromochloromethane	1.1	ug/L	2.7	0.91	0.933	0.001	0.004	0.004
16	Methylene chloride	1.3	ug/L	4.56	4.29	0.744	0.001	0.016	0.003
16	Tetrachloroethylene	1.1	ug/L	1.8	0.446	0.4	–	0.002	0.002
17	Benzene	0.5	ug/L	0.585	0.833	0.14	–	0.004	0.001
19	Bis(2-ethylhexyl) phthalate	2.2	ug/L	6.38	2.98		0.002	0.012	
19	Di-n-butyl phthalate	3.8	ug/L	4.41	3.84		0.001	0.015	

Continued

ICI Canada
Cornwall

		CONCENTRATIONS					LOADINGS kg/d		
ATG	PARAMETER	RMDL	UNIT	PR 0400	CO 0300	IN 0200	PR 0400	CO 0300	IN 0200
23	1,2,3,4-Tetrachlorobenzene	10	ng/L	18.3	8.01	10	–	–	–
23	1,2,3,5-Tetrachlorobenzene	10	ng/L	8.63	2.93	3	–	–	–
23	1,2,3-Trichlorobenzene	10	ng/L	23.6	10.6	11.3	–	–	–
23	1,2,4,5-Tetrachlorobenzene	10	ng/L	13.1	3.85	3	–	–	–
23	1,2,4-Trichlorobenzene	10	ng/L	294	79	3	–	–	–
23	2,4,5-Trichlorotoluene	10	ng/L	33.6	4.4	3	–	–	–
23	Hexachlorobenzene	10	ng/L	136	111	3	–	–	–
23	Hexachlorobutadiene	10	ng/L	249	167	5	–	–	–
23	Hexachlorocyclopentadiene	10	ng/L	39.1	15.1	17	–	–	–
23	Hexachloroethane	10	ng/L	949	1670	3.17	–	0.007	–
23	Octachlorostyrene	10	ng/L	56.2	15.8	6.92	–	–	–
23	Pentachlorobenzene	10	ng/L	80.8	14.5	4	–	–	–
24	Octachlorodibenzofuran	30	pg/L	761	113		–	–	
24	Total H6CDD	30	pg/L	59.6	22		–	–	
24	Total H6CDF	20	pg/L	1210	206		–	–	
24	Total H7CDF	30	pg/L	1140	20		–	–	
24	Total P5CDD	20	pg/L	476	26.8		–	–	
24	Total P5CDF	15	pg/L	2900	674		–	–	
24	Total T4CDD	20	pg/L	74.7	17		–	–	
24	Total T4CDF	15	pg/L	7620	997		–	–	
2	Cyanide Total	0.005	mg/L	0.392	0.077		0.058	0.237	
27	PCBT	0.1	ug/L	0.306	0.077		–	–	
98	Ftflow		m3/d	229	4010				
I1	Chloride	2	mg/L	16900	1050	23.6	3690	3940	94.8
I2	Fluoride	0.1	mg/L	1.31	1.12		0.323	4.90	
I3	Sulphate	5	mg/L	1310	297	26.6	294	1200	107

Notes

PR0400 is the "Effluent in Manhole #15" and this flows into CO0300.
CO0300 is the "Effluent in LEL-2" and this discharges to the St.Lawrence River.

Intake loadings are based on municipal intake analyses and the mean discharge flow from CO0300.
Intake loadings are probable upper bounds because of substantial rainfall contributions to the flow.

ICI Canada
Courtright

		CONCENTRATIONS					LOADINGS kg/d			
ATG	PARAMETER	RMDL	UNIT	PR 0300	CO 0200	CO 0500	CO 0700	PR 0300	CO 0200	CO 0500	CO 0700
c	Total suspended solids	5	mg/L	37	6.56	7.61	5.96	168	1130	80.7	333
c	Hydrogen Ion (pH)			8.78	7.93	8.19	8.24				
c	Specific conductance		uS/cm	516	230	278	212				
c	DOC	0.5	mg/L	10.4	2.72	3.21	3.05	40.5	464	35.3	161
c	TOC	5	mg/L	11.3	4.13	4.71	4.81	43.1	709	48.6	256
c	Oil and grease	1	mg/L	0.687	0.711	0.717	0.766	2.62	120	7.58	43.2
c	Ammonia plus Ammonium	0.25	mg/L	26.1	1.17	2.36	1.39	96.4	200	20.4	63.8
c	Nitrate+Nitrite	0.25	mg/L	24.2	1.13	3.96	0.818	98.3	192	38.8	45.3
c	Total Kjeldahl nitrogen	0.5	mg/L	33	2	3.39	2.92	122	345	29.7	142
c	Total phosphorus	0.1	mg/L	0.36	0.066	0.214	0.123	1.75	11.3	2.11	7.33
09	Aluminum	30	ug/L	413	98	105	89.8	1.82	16	1.11	5.03
09	Boron	50	ug/L	16.8	25	16.9	14.7	0.073	4.36	0.184	0.829
09	Copper	10	ug/L	9.43	2.1	4.55	4.57	0.046	0.349	0.048	0.26
09	Strontium	20	ug/L	133	102	115	98.5	0.585	17.3	1.18	5.59
09	Zinc	10	ug/L	429	5.5	51.9	23.1	1.82	0.966	0.596	1.27
12	Mercury	0.1	ug/L	0.085	0.07	0.11	0.095	–	0.012	0.001	0.005
14	Phenolics (4AAP)	2	ug/L	6.53	7.5	30.9	13.3	0.028	1.402	0.302	0.793
15	Sulphide	20	ug/L	27.5	16.5	15.8	15.8	0.103	2.788	0.182	0.888
16	Chloroform	0.7	ug/L	0.08	0.09	1.61	0.08	–	0.015	0.012	0.005
16	Chloromethane	3.7	ug/L	1.28	5.89	6.63	5.72	0.004	1.105	0.062	0.308
16	Methylene chloride	1.3	ug/L	1.53	7.85	0.221	2.43	0.005	1.200	0.002	0.141
17	m–Xylene and p–Xylene	1.1	ug/L	0.11	0.11	0.11	0.11	–	0.019	0.002	0.006
19	Benzylbutylphthalate	0.6	ug/L	0.165	0.13	0.272	0.418	0.001	0.023	0.004	0.021
19	Bis(2–ethylhexyl) phthalate	2.2	ug/L	0.315	0.22	0.465	1.99	0.001	0.038	0.004	0.094
19	Diphenyl ether	0.4	ug/L	0.335	0.22	0.335	0.335	0.001	0.041	0.004	0.018
20	Phenol	2.4	ug/L	1.89	0.37	2.35	10.7	0.009	0.065	0.031	0.584
23	Hexachloroethane	10	ng/L	30.3	5.5	22.8	7.75	–	0.001	0.000	0.001
2	Cyanide Total	0.005	mg/L	0.011	0.007	0.007	0.005	0.042	1.231	0.072	0.316
98	Ftflow		m3/d	3610	171000	10300	55700				
I1	Chloride	2	mg/L	25.7	8.28	12.2	9.2	95.4	1430	137	508
I2	Fluoride	0.1	mg/L	0.295		0.122	0.085	1.21		1.25	4.69
I3	Sulphate	5	mg/L	35.2	19.9	21.8	16.9	142	3370	224	948

Continued

		CONCENTRATIONS					LOADINGS kg/d		
ATG	PARAMETER	RMDL	UNIT	CO 0800	CO 1000	OT 0600	CO 0800	CO 1000	OT 0600
c	Total suspended solids	5	mg/L	11.4	39	5.91	191	2.66	92.5
c	Hydrogen ion (pH)			7.74	9.16	8.11			
c	Specific conductance		uS/cm	257	7400	218			
c	DOC	0.5	mg/L	6.94	23.7	1.81	113	1.37	33.7
c	TOC	5	mg/L	7.99	24.6	4.22	129	1.42	69.4
c	Oil and grease	1	mg/L	0.677	0.759	0.653	10.9	0.047	11.9
c	Ammonia plus Ammonium	0.25	mg/L	2.49	0.174	0.112	40.6	0.011	2.04
c	Nitrate+Nitrite	0.25	mg/L	0.652	13	0.364	10.4	0.992	6.69
c	Total Kjeldahl nitrogen	0.5	mg/L	3.01	1.83	0.499	48.9	0.127	9.17
c	Total phosphorus	0.1	mg/L	0.064	0.168	0.047	1.01	0.009	0.859
09	Aluminum	30	ug/L	122	208	79.6	2.05	0.015	1.43
09	Boron	50	ug/L	16	263	16.5	0.272	0.018	0.298
09	Copper	10	ug/L	14.5	20.4	3.53	0.237	0.002	0.067
09	Strontium	20	ug/L	111	1070	98.3	1.82	0.071	1.8
09	Zinc	10	ug/L	42	21.5	22.8	0.735	0.002	0.413
12	Mercury	0.1	ug/L	1.46	0.3		0.021	–	
14	Phenolics (4AAP)	2	ug/L	13.8	2.05	1.24	0.226	–	0.023
15	Sulphide	20	ug/L	16.7	15		0.264	0.001	
16	Chloroform	0.7	ug/L	0.083	0.14		0.001	–	
16	Chloromethane	3.7	ug/L	3.29	2.5		0.048	–	
16	Methylene chloride	1.3	ug/L	0.425	0.2		0.008	–	
17	m–Xylene and p–Xylene	1.1	ug/L	0.111	1.37		0.002	–	
19	Benzylbutylphthalate	0.6	ug/L	0.232	0.7		0.004	–	
19	Bis(2–ethylhexyl) phthalate	2.2	ug/L	1.57	3.51		0.023	0.001	
19	Diphenyl ether	0.4	ug/L	0.335	0.45		0.005	–	
20	Phenol	2.4	ug/L	6.94	1.55		0.128	–	
23	Hexachloroethane	10	ng/L	7.75	65		–	–	
2	Cyanide Total	0.005	mg/L	0.006	0.007		0.101	–	
98	Ftflow		m3/d	16100	58.9	17700			
I1	Chloride	2	mg/L	10.5	188		171	11.9	
I2	Fluoride	0.1	mg/L	0.087	0.65		1.43	0.05	
I3	Sulphate	5	mg/L	40.7	3550	17.677	724	205	324

Continued

ICI Canada
Courtright

		CONCENTRATIONS					LOADINGS kg/d		
ATG	PARAMETER	RMDL	UNIT	OT 1100	OT 1200	IN 1400	OT 1100	OT 1200	IN 1400
c	Total suspended solids	5	mg/L	5.71	12.7	7.5	390	105	1280
c	Hydrogen Ion (pH)			8.14	8.19	7.58			
c	Specific conductance		uS/cm	215	222	1000			
c	DOC	0.5	mg/L	1.61	1.58	1.98	104	11.9	338
c	TOC	5	mg/L	3.95	3.95	3.78	268	32.3	645
c	Oil and grease	1	mg/L	0.718	0.643	3.71	45.5	5.02	634
c	Ammonia plus Ammonium	0.25	mg/L	0.118	0.112	0.207	7.69	0.874	35.4
c	Nitrate+Nitrite	0.25	mg/L			0.487			83.3
c	Total Kjeldahl nitrogen	0.5	mg/L			1.63			279
c	Total phosphorus	0.1	mg/L	0.052	0.050	0.058	3.49	0.394	9.92
09	Aluminum	30	ug/L			98.7			16.9
09	Boron	50	ug/L			19.7			3.37
09	Copper	10	ug/L			17.9			3.05
09	Strontium	20	ug/L			95.6			16.3
09	Zinc	10	ug/L			41			7.01
12	Mercury	0.1	ug/L			0.36			0.062
14	Phenolics (4AAP)	2	ug/L			4.39			0.75
15	Sulphide	20	ug/L			16			2.74
16	Chloroform	0.7	ug/L			0.08			0.014
16	Chloromethane	3.7	ug/L			7.17			1.23
16	Methylene chloride	1.3	ug/L			0.317			0.054
17	m-Xylene and p-Xylene	1.1	ug/L			0.11			0.019
19	Benzylbutylphthalate	0.6	ug/L			0.3			0.051
19	Bis(2-ethylhexyl) phthalate	2.2	ug/L			2.61			0.447
19	Diphenyl ether	0.4	ug/L			0.433			0.074
20	Phenol	2.4	ug/L			3.03			0.519
23	Hexachloroethane	10	ng/L			10			0.002
2	Cyanide Total	0.005	mg/L			0.007			1.2
98	Ftflow		m3/d	66800	7880	97200			
I1	Chloride	2	mg/L			9.12			1560
I2	Fluoride	0.1	mg/L			0.095			16.2
I3	Sulphate	5	mg/L			17.9			3060

Continued

Notes:

Streams listed for monitoring under regulation at this plant were:
PR0300 is the effluent stream "Drainage Ditch after Emergency Containment Basin" which flows into 0200.
CO0200 is the "Plant Final Effluent" which discharges into the St. Clair River.
CO0400 is the stream "Effluent from Gypsum Ponds". Zero flow was reported for this stream.
CO0500 is the stream "Effluent from 30" Concrete Pipe" which discharges into 0200.
CO0700 is the stream "Effluent in Manhole #55" which discharges into 0200.
CO0800 is the stream "Effluent in 42" from A–II" which discharges into 0200.
CO1000 is the effluent stream "A–II Neutralizer Pit Overflow" also discharging into 0200. Monitoring ceased May 1990.
BA0900 is the stream "Effluent from A–I Regenerator". No usable data were reported before shutdown March 1990.
OT0600 is the stream "Effluent in 18" Black Polyethylene Pipe" which discharges into 0200.
OT1100 is the stream "Effluent in 72" line from A–I" which discharged into 0200.
OT1200 is the stream "Effluent in Open Ditch from Ammonia Storage" which discharges into 0200.

Flow measurements at 0300, 0200, 0500 and 0800 used primary devices with externally established performance.
All were hydraulically modified but may be reliable within the regulation accuracy requirements.
Flow values and loadings for other streams should be interpreted with caution.
Methods of unestablished accuracy levels were used for flow values at these points.

Intake loadings are based on CO0200 mean flow and are probable upper bound values;
this is because of rain contributions to the flow from the large plant catchment area.

IMC
Port Maitland

		CONCENTRATIONS			LOADINGS kg/d
ATG	PARAMETER	RMDL	UNIT	CO 0300	CO 0300
c	Total suspended solids	5	mg/L	7.76	22.3
c	Hydrogen ion (pH)			7.68	
c	Specific conductance		uS/cm	2860	
c	DOC	0.5	mg/L	7.6	20.5
c	TOC	5	mg/L	6.91	18.6
c	Oil and grease	1	mg/L	1.06	3.05
c	Ammonia plus Ammonium	0.25	mg/L	1.09	3.07
c	Nitrate+Nitrite	0.25	mg/L	0.757	2.13
c	Total Kjeldahl nitrogen	0.5	mg/L	1.65	4.71
c	Total phosphorus	0.1	mg/L	0.645	1.87
09	Aluminum	30	ug/L	69	0.203
09	Boron	50	ug/L	87.5	0.237
09	Strontium	20	ug/L	823	2.25
09	Zinc	10	ug/L	10.2	0.03
14	Phenolics (4AAP)	2	ug/L	8.75	0.021
15	Sulphide	20	ug/L	40	0.106
24	Octachlorodibenzo-p-dioxin	30	pg/L	41	-
98	Ftflow		m3/d	2860	
I1	Chloride	2	mg/L	42	115
I2	Fluoride	0.1	mg/L	9.48	27.1
I3	Sulphate	5	mg/L	1690	4830

Notes

CO0300 is the stream "Final Effluent to River". This discharges into Lake Erie.

Linde
Moore

		CONCENTRATIONS			LOADINGS kg/d
ATG	PARAMETER	RMDL	UNIT	CO 0100	CO 0100
c	Total suspended solids	5	mg/L	8.78	0.042
c	Hydrogen ion (pH)			8.29	
c	Specific conductance		uS/cm	899	
c	DOC	0.5	mg/L	9.84	0.047
c	TOC	5	mg/L	11.8	0.057
c	Oil and grease	1	mg/L	2.48	0.012
c	Ammonia plus Ammonium	0.25	mg/L	0.07	–
c	Nitrate+Nitrite	0.25	mg/L	11.4	0.055
c	Total Kjeldahl nitrogen	0.5	mg/L	2.59	0.012
c	Total phosphorus	0.1	mg/L	0.923	0.004
09	Aluminum	30	ug/L	303	0.001
09	Boron	50	ug/L	746	0.004
09	Chromium	20	ug/L	26.7	–
09	Copper	10	ug/L	45.8	–
09	Strontium	20	ug/L	549	0.003
09	Zinc	10	ug/L	121	–
10	Antimony	5	ug/L	3	–
10	Arsenic	5	ug/L	16.5	–
16	Bromoform	3.7	ug/L	21.5	–
16	Methylene chloride	1.3	ug/L	6.25	–
17	Toluene	0.5	ug/L	0.43	–
19	Bis(2-ethylhexyl) phthalate	2.2	ug/L	3.45	–
24	Octachlorodibenzo-p-dioxin	30	pg/L	56	–
24	Octachlorodibenzofuran	30	pg/L	75	–
24	Total H7CDD	30	pg/L	34.5	–
2	Cyanide Total	0.005	mg/L	0.012	–
98	Ftflow		m3/d	4.8	
I1	Chloride	2	mg/L	73.4	0.352
I2	Fluoride	0.1	mg/L	2.85	0.014
I3	Sulphate	5	mg/L	105	0.504

Notes:

CO0100 is the "Final Effluent" stream which discharges into the St.Clair River.

Flow values were estimated due to fitting of an incorrectly oversized device by Linde at 12.1 m3/day. The flow above is based on production and ministry measurements at Linde Sarnia.
Flow and loading values therefore should be treated with caution.

Linde
Sarnia

		CONCENTRATIONS			LOADINGS kg/d
ATG	PARAMETER	RMDL	UNIT	CO 0100	CO 0100
c	Total suspended solids	5	mg/L	10.5	0.215
c	Hydrogen ion (pH)			7.77	
c	Specific conductance		uS/cm	876	
c	DOC	0.5	mg/L	10.6	0.217
c	TOC	5	mg/L	12.9	0.264
c	Oil and grease	1	mg/L	2.51	0.051
c	Ammonia plus Ammonium	0.25	mg/L	0.305	0.006
c	Nitrate+Nitrite	0.25	mg/L	3.7	0.076
c	Total Kjeldahl nitrogen	0.5	mg/L	3.92	0.08
c	Total phosphorus	0.1	mg/L	1.06	0.022
09	Aluminum	30	ug/L	281	0.006
09	Boron	50	ug/L	854	0.018
09	Copper	10	ug/L	134	0.003
09	Strontium	20	ug/L	489	0.01
09	Zinc	10	ug/L	454	0.009
10	Antimony	5	ug/L	4.5	–
10	Arsenic	5	ug/L	9.5	–
14	Phenolics (4AAP)	2	ug/L	2.5	–
16	1,1–Dichloroethane	0.8	ug/L	0.8	–
16	Bromoform	3.7	ug/L	8	–
16	Chloroform	0.7	ug/L	0.65	–
16	Methylene chloride	1.3	ug/L	6.6	–
17	Toluene	0.5	ug/L	0.38	–
19	Bis(2–ethylhexyl) phthalate	2.2	ug/L	3.5	–
24	Octachlorodibenzo–p–dioxin	30	pg/L	585	–
24	Octachlorodibenzofuran	30	pg/L	54.5	–
24	Total H6CDD	30	pg/L	31	–
24	Total H6CDF	20	pg/L	24.5	–
24	Total H7CDD	30	pg/L	119	–
24	Total H7CDF	30	pg/L	38	–
98	Ftflow		m3/d	20.5	
I1	Chloride	2	mg/L	66.5	1.36
I2	Fluoride	0.1	mg/L	1.8	0.037
I3	Sulphate	5	mg/L	120	2.46

Notes:

CO0100 is the "Effluent to Cole Drain from Cooling Towers".
The Cole Drain discharges into the St. Clair River.

Flow readings were estimated by Linde by approximate calculation at 160 m3/day.
A temporary ministry meter registered the mean flow rate shown on dry days.
Loadings are calculated on 20.5 m3/day and may underestimate storm loadings.
Flow and loading values therefore should be treated with caution.

Linde
Sault Ste Marie

		CONCENTRATIONS			LOADINGS kg/d
ATG	PARAMETER	RMDL	UNIT	CO 0100	CO 0100
c	Total suspended solids	5	mg/L	19.3	6.26
c	Hydrogen ion (pH)			8.48	
c	Specific conductance		uS/cm	468	
c	DOC	0.5	mg/L	9.55	2.52
c	TOC	5	mg/L	13.1	3.39
c	Oil and grease	1	mg/L	2.25	0.617
c	Ammonia plus Ammonium	0.25	mg/L	0.073	0.026
c	Nitrate+Nitrite	0.25	mg/L	1.54	0.51
c	Total Kjeldahl nitrogen	0.5	mg/L	0.935	0.388
c	Total phosphorus	0.1	mg/L	1.07	0.268
09	Aluminum	30	ug/L	403	0.088
09	Boron	50	ug/L	677	0.295
09	Copper	10	ug/L	333	0.118
09	Strontium	20	ug/L	144	0.041
09	Zinc	10	ug/L	166	0.041
14	Phenolics (4AAP)	2	ug/L	2	0.001
16	1,3-Dichlorobenzene	1.1	ug/L	0.7	0.001
16	1,4-Dichlorobenzene	1.7	ug/L	1.1	0.001
16	Bromomethane	3.7	ug/L	3.39	0.002
16	Chloroform	0.7	ug/L	8.95	0.004
16	Cis-1,3-Dichloropropylene	1.4	ug/L	1.1	0.001
16	Methylene chloride	1.3	ug/L	2.3	0.001
17	Styrene	0.5	ug/L	0.63	-
24	Octachlorodibenzo-p-dioxin	30	pg/L	32400	-
24	Octachlorodibenzofuran	30	pg/L	285	-
24	Total H6CDD	30	pg/L	470	-
24	Total H6CDF	20	pg/L	300	-
24	Total H7CDD	30	pg/L	5170	-
24	Total H7CDF	30	pg/L	373	-
24	Total PCDD	20	pg/L	50	-
2	Cyanide Total	0.005	mg/L	0.021	0.001
98	Ftflow		m3/d	249	
I1	Chloride	2	mg/L	21	5.2
I3	Sulphate	5	mg/L	33	8.97

Notes

CO0100 is the "Effluent from Outfall at Safety Drive".
This effluent is discharged to the St. Marys River and Lake Superior.

Flow data and loadings should be treated with caution; an estimation method was used for much of the monitored period.

Liquid Carbonic
Courtright

				CONCENTRATIONS		LOADINGS kg/d	
ATG	PARAMETER	RMDL	UNIT	CO 0100	IN 0300	CO 0100	IN 0300
c	Total suspended solids	5	mg/L	2.93	3.33	14.1	16.1
c	Hydrogen ion (pH)			8.47			
c	Specific conductance		uS/cm	217			
c	DOC	0.5	mg/L	5.79	2.5	29.1	12.1
c	TOC	5	mg/L	5.89	3.7	30.9	18
c	Oil and grease	1	mg/L	2.52	4.97	11.5	24.1
c	Ammonia plus Ammonium	0.25	mg/L	0.31		0.433	
c	Nitrate+Nitrite	0.25	mg/L	0.2		0.279	
c	Total Kjeldahl nitrogen	0.5	mg/L	0.5		0.698	
c	Total phosphorus	0.1	mg/L	0.019	0.01	0.101	0.049
09	Aluminum	30	ug/L	63.5	51.6	0.32	0.25
09	Boron	50	ug/L	72.1	83.8	0.406	0.407
09	Strontium	20	ug/L	415	590	2.58	2.86
09	Zinc	10	ug/L	14.5	87	0.076	0.422
98	Ftflow		m3/d	4860			

Notes

CO0100 is the "Effluent to South Ditch".
Discharge is to the St. Clair River via ICI Courtright stream CO 0200.

Liquid Carbonic Inc.
Maitland

				CONCENTRATIONS		LOADINGS kg/d	
ATG	PARAMETER	RMDL	UNIT	CO 0100	IN 0300	CO 0100	IN 0300
c	Total suspended solids	5	mg/L	1.32	1.1	2.86	2.4
c	Hydrogen ion (pH)			7.71			
c	Specific conductance		uS/cm	848			
c	DOC	0.5	mg/L	8.02	1.9	18	4.15
c	TOC	5	mg/L	9.25	5.46	18.5	11.9
c	Oil and grease	1	mg/L	2.88	5.22	5.95	11.4
c	Ammonia plus Ammonium	0.25	mg/L	0.35		0.807	
c	Nitrate+Nitrite	0.25	mg/L	3.9		8.99	
c	Total Kjeldahl nitrogen	0.5	mg/L	0.6		1.38	
c	Total phosphorus	0.1	mg/L	0.064	0.127	0.162	0.277
09	Aluminum	30	ug/L	87.8	61.6	0.084	0.134
09	Boron	50	ug/L	195	188	0.458	0.411
09	Strontium	20	ug/L	1640	1660	3.91	3.63
09	Zinc	10	ug/L	86.7	244	0.214	0.533
98	Ftflow		m3/d	2180			

Notes

Flow data accuracy may have been affected by a hydraulic disturbance immediately upstream of the primary flow monitoring device.

CO0100 is the "Effluent to Main Outfall" which flows to the St. Lawrence River.

Nitrochem
Maitland

				CONCENTRATIONS		LOADINGS kg/day	
ATG	PARAMETER	RMDL	UNIT	CO 0400	IN 0800	CO 0400	IN 0800
c	Total suspended solids	5	mg/L	199	4.2	197	3.35
c	Hydrogen ion (pH)			9.63	7.94		
c	Specific conductance		uS/cm	3390	315		
c	DOC	0.5	mg/L	32.5	1.6	21.8	1.28
c	TOC	5	mg/L	30.9		20.5	
c	Oil and grease	1	mg/L	20.4	1.53	1.81	1.22
c	Ammonia plus Ammonium	0.25	mg/L	112	14.9	102	11.9
c	Nitrate+Nitrite	0.25	mg/L	92.4	22.6	90.2	18
c	Total Kjeldahl nitrogen	0.5	mg/L	122	7.7	108	6.15
c	Total phosphorus	0.1	mg/L	1.36	0.069	1.09	0.055
09	Aluminum	30	ug/L	594	33	0.558	0.026
09	Boron	50	ug/L	106	21	0.086	0.017
09	Copper	10	ug/L	56.3	2	0.044	0.002
09	Strontium	20	ug/L	267	156	0.238	0.125
09	Vanadium	30	ug/L	200	3	0.14	0.002
09	Zinc	10	ug/L	52.9	4	0.041	0.003
12	Mercury	0.1	ug/L	0.168	0.019	–	–
14	Phenolics (4AAP)	2	ug/L	85.5	1	0.058	0.001
15	Sulphide	20	ug/L	84.8	40	0.021	0.032
16	1,1–Dichloroethane	0.8	ug/L	1.08	0.5	0.001	–
16	1,1–Dichloroethylene	2.8	ug/L	1.88	0.4	0.001	–
16	Bromoform	3.7	ug/L	3.99	0.37	0.003	–
16	Chloroform	0.7	ug/L	2.95	0.4	0.001	–
16	Tetrachloroethylene	1.1	ug/L	44.5	0.2	0.027	–
16	Trans–1,2–Dichloroethylene	1.4	ug/L	6.13	0.4	0.005	–
16	Trichloroethylene	1.9	ug/L	2.35	0.3	0.002	–
17	Benzene	0.5	ug/L	0.2	0.85	–	0.001
17	Toluene	0.5	ug/L	0.4	1.6	–	0.001
20	Phenol	2.4	ug/L	13.8	1.1	0.011	0.001
24	Octachlorodibenzo–p–dioxin	30	pg/L	760	20	–	–
24	Octachlorodibenzofuran	30	pg/L	37.2	22	–	–
24	Total H6CDF	20	pg/L	24.4	15	–	–
24	Total H7CDD	30	pg/L	220	17	–	–
24	Total H7CDF	30	pg/L	62.6	20	–	–
2	Cyanide Total	0.005	mg/L	0.321	0.001	0.024	0.001
27	PCBT	0.1	ug/L	0.377	0.05	–	–
98	Ftflow		m3/d	798			
I1	Chloride	2	mg/L	97	21	60.1	16.8
I2	Fluoride	0.1	mg/L	0.275	0.100	0.163	0.080
I3	Sulphate	5	mg/L	518	25	335	20

Notes

CO0400 is the "Final Effluent" which discharges into the St. Lawrence River.

Flow value and loadings are of uncertain accuracy due to incorrect flow monitoring device settings.

Norton
Niagara Falls

		CONCENTRATIONS						LOADINGS kg/d			
ATG	PARAMETER	RMDL	UNIT	CO0200	CO0300	CO0400	IN0800	CO0200	CO0300	CO0400	IN0800
c	Total suspended solids	5	mg/L	16.7	18.8	12.4	10.2	36.3	36.1	46	87.1
c	Hydrogen ion (pH)			7.89	7.98	8.08	7.93				
c	Specific conductance		uS/cm	367	700	330	295				
c	DOC	0.5	mg/L	2.2	2.01	2.07	2.1	5.28	3.97	8.18	18
c	TOC	5	mg/L	3.15	2.53	2.65	2.62	6.68	4.2	8.78	22.5
c	Oil and grease	1	mg/L	1.38	1.43	1.71	1.36	3.03	2.72	6.85	11.7
c	Ammonia plus Ammonium	0.25	mg/L	0.035	0.756	0.067	0.029	0.107	1.71	0.207	0.249
c	Nitrate+Nitrite	0.25	mg/L	0.4	0.25	0.25	0.239	1.21	0.483	0.883	2.05
c	Total Kjeldahl nitrogen	0.5	mg/L	0.28	0.976	0.36	0.622	0.846	2.07	1.22	5.33
c	Total phosphorus	0.1	mg/L	0.188	0.057	0.034	0.049	0.199	0.122	0.128	0.42
09	Aluminum	30	ug/L	748	2150	1140	311	2.11	4.23	4.3	2.67
09	Boron	50	ug/L	80.4	45.4	35.8	79.9	0.196	0.086	0.144	0.685
09	Chromium	20	ug/L	11.4	14.8	13.5	11.9	0.027	0.031	0.057	0.102
09	Copper	10	ug/L	8.3	22.1	13	8.47	0.02	0.038	0.051	0.073
09	Strontium	20	ug/L	181	545	269	178	0.378	1.19	1.03	1.53
09	Zinc	10	ug/L	21.6	26.5	27.9	21.9	0.056	0.05	0.118	0.188
12	Mercury	0.1	ug/L	0.136	0.081	0.098	0.092	–	–	–	0.001
14	Phenolics (4AAP)	2	ug/L	1	2.5	0.6	1.5	0.003	0.006	0.002	0.013
15	Sulphide	20	ug/L	10	20	10	10	0.030	0.054	0.034	0.086
16	1,1–Dichloroethane	0.8	ug/L	3.65	0.95	1.95	0.8	0.010	0.002	0.008	0.007
16	1,1–Dichloroethylene	2.8	ug/L	2.45	1.2	0.9	0.8	0.007	0.003	0.003	0.007
16	1,2–Dichlorobenzene	1.4	ug/L	1.5	0.9	0.9	4.2	0.005	0.003	0.003	0.036
16	1,2–Dichloroethane	0.8	ug/L	1.25	0.8	0.8	0.8	0.004	0.002	0.003	0.007
16	1,3–Dichlorobenzene	1.1	ug/L	1.5	1.1	1.1	2.3	0.005	0.003	0.004	0.020
16	1,4–Dichlorobenzene	1.7	ug/L	1.45	1.1	1.1	1.1	0.005	0.003	0.004	0.009
16	Chloroform	0.7	ug/L	3.25	0.8	2.25	2.2	0.009	0.002	0.008	0.019
16	Methylene chloride	1.3	ug/L	6.65	1.6	2.7	4.6	0.019	0.004	0.010	0.039
16	Trichlorofluoromethane	1	ug/L	1.15	1	1	1	0.004	0.003	0.004	0.009
17	Benzene	0.5	ug/L	1.55	0.95	1.15	1.6	0.005	0.002	0.005	0.014
17	Toluene	0.5	ug/L	1.05	0.5	2.05	2.6	0.003	0.001	0.008	0.022
17	o–Xylene	0.5	ug/L	0.65	0.5	0.5	0.5	0.002	0.001	0.002	0.004
19	Bis(2–ethylhexyl) phthalate	2.2	ug/L	15	1.5	1.5	1.4	0.048	0.004	0.005	0.012
98	Flow, Average		m3/d	2560	1970	4050					
I1	Chloride	2	mg/L	17.8	21.3	25	15.4	53.8	53.4	80.1	132
I2	Fluoride	0.1	mg/L	0.225	0.205	0.23	0.17	0.697	0.51	0.741	1.44
I3	Sulphate	5	mg/L	35.3	237	50.6	26.9	107	511	167	231

Notes: CO0200, CO0300 and CO0400 are the effleunts in "Sewers B,C and D" respectively. All discharge into the Welland River.

Intake loadings have been calculated from intake analyses and the sum of the effluent flows.
These loadings values probably represent an upper bound due to rainfall contributions to the flow.

Partek
Sarnia

		CONCENTRATIONS			LOADINGS kg/d
ATG	PARAMETER	RMDL	UNIT	OT 0300	OT 0300
c	Total suspended solids	5	mg/L	1.08	0.034
c	Hydrogen ion (pH)			7.27	
c	Specific conductance		uS/cm	224	
c	DOC	0.5	mg/L	1.31	0.041
c	TOC	5	mg/L	72	2.02
c	Ammonia + Ammonium	0.25	mg/L		
c	Nitrate + Nitrite	0.25	mg/L		
c	Total Kjeldahl nitrogen	0.5	mg/L		
c	Oil and grease	1	mg/L	1.82	0.058
c	Total phosphorus	0.1	mg/L	0.068	0.002
98	Ftflow		m3/d	31.1	
I3	Sulphate	5	mg/L	19.3	0.541

Notes:

OT0300 is the "Cooling Water Overflow Effluent".
This effluent eventually reaches the St. Clair River.

Puritan – Bennett
Maitland

		CONCENTRATIONS				LOADINGS kg/d	
ATG	PARAMETER	RMDL	UNIT	OT 0100	IN 0300	OT 0100	IN 0300
c	Total suspended solids	5	mg/L	2.66	3	0.718	0.81
c	Hydrogen ion (pH)			7.98	8.09		
c	Specific conductance		uS/cm	1160	1070		
c	DOC	0.5	mg/L	2.55	3.56	0.689	0.961
c	TOC	5	mg/L	4.4	3.4	1.19	0.918
c	Oil and grease	1	mg/L	0.945	0.95	0.255	0.257
c	Ammonia plus Ammonium	0.25	mg/L	58.5	53.3	15.8	14.4
c	Nitrate+Nitrite	0.25	mg/L	51.7	34.4	14	9.29
c	Total Kjeldahl nitrogen	0.5	mg/L	61.8	55	16.7	14.9
c	Total phosphorus	0.1	mg/L	0.114	0.093	0.031	0.025
98	Ftflow		m3/d	270			

Notes:

OT0100 is the "Effluent to Creek" which is discharged into the St. Lawrence River.

Sulco Chemicals
Elmira

		CONCENTRATIONS			LOADINGS kg/d
ATG	PARAMETER	RMDL	UNIT	CO 0100	CO 0100
c	Total suspended solids	5	mg/L	14.8	0.739
c	Hydrogen ion (pH)			7.63	
c	Specific conductance		uS/cm	7570	0.000
c	DOC	0.5	mg/L	4.97	0.356
c	TOC	5	mg/L	7.83	0.546
c	Oil and grease	1	mg/L	2.26	0.157
c	Ammonia plus Ammonium	0.25	mg/L	0.257	0.021
c	Nitrate+Nitrite	0.25	mg/L	9.73	0.679
c	Total Kjeldahl nitrogen	0.5	mg/L	0.854	0.060
c	Total phosphorus	0.1	mg/L	0.664	0.046
09	Aluminum	30	ug/L	240	0.017
09	Boron	50	ug/L	173	0.013
09	Cadmium	2	ug/L	5.16	–
09	Cobalt	20	ug/L	16.5	0.001
09	Copper	10	ug/L	37	0.003
09	Lead	30	ug/L	33.9	0.003
09	Nickel	20	ug/L	38.1	0.003
09	Strontium	20	ug/L	6650	0.483
09	Vanadium	30	ug/L	53.2	0.004
09	Zinc	10	ug/L	1590	0.110
10	Arsenic	5	ug/L	5.5	–
12	Mercury	0.1	ug/L	0.07	–
14	Phenolics (4AAP)	2	ug/L	3.57	–
15	Sulphide	20	ug/L	23.9	0.002
16	Chloroform	0.7	ug/L	2.97	–
19	Benzylbutylphthalate	0.6	ug/L	0.4	–
19	Bis(2-ethylhexyl) phthalate	2.2	ug/L	1.25	–
2	Cyanide Total	0.005	mg/L	0.03	0.002
98	Ftflow		m3/d	68.1	
I1	Chloride	2	mg/L	1830	123
I2	Fluoride	0.1	mg/L	4.07	0.278
I3	Sulphate	5	mg/L	1640	114

Notes:

CO0100 is the "Final Effluent". This is discharged into Canagagigue Creek.
This creek joins the Grand River.

UCAR Carbon
Welland

		CONCENTRATIONS					LOADINGS kg/d		
ATG	PARAMETER	RMDL	UNIT	CO 0200	CO 0300	OT 0100	CO 0200	CO 0300	OT 0100
c	Total suspended solids	5	mg/L	5.81	4.53	4.34	0.95	26.8	2.59
c	Hydrogen ion (pH)			8.02	8.08	8.21			
c	Specific conductance		uS/cm	1260	370	355			
c	DOC	0.5	mg/L	7.34	3.14	2.84	0.489	18.5	1.58
c	TOC	5	mg/L	3.12	3.37	0.9	0.491	0.902	0.506
c	Oil and grease	1	mg/L	2.09	1.32	1.63	0.215	7.56	0.736
c	Ammonia plus Ammonium	0.25	mg/L	0.142	0.065		0.016	0.516	
c	Nitrate+Nitrite	0.25	mg/L	0.832	0.4		0.092	2.88	
c	Total Kjeldahl nitrogen	0.5	mg/L	0.492	0.825		0.049	7.09	
c	Total phosphorus	0.1	mg/L	0.09	0.085	0.079	0.007	0.592	0.049
09	Aluminum	30	ug/L	208	179	154	0.045	1.08	0.087
09	Boron	50	ug/L	76.7	32.7	25.3	0.007	0.145	0.015
09	Strontium	20	ug/L	1000	324	210	0.113	1.23	0.127
09	Zinc	10	ug/L	52.9	40.6	52.8	0.009	0.135	0.04
14	Phenolics (4AAP)	2	ug/L	4.58	3	1.32	–	0.017	0.001
20	Phenol	2.4	ug/L	2.55	1.1		–	–	
24	Octachlorodibenzo–p–dioxin	30	pg/L	31	36.5		–	–	
98	Flow, Average		m3/d	180	6260				
98	Ftflow		m3/d			600			
I1	Chloride	2	mg/L	151	21.3		20.2	116	
I2	Fluoride	0.1	mg/L	0.4	0.1		0.022	0.749	
I3	Sulphate	5	mg/L	240	52.6		38.5	192	

Notes:

CO0200 is the "Government Dock Effluent". This discharges into the Welland Canal.
CO0300 is the "Effluent from the Pump House Return". This also discharges into the canal.
OT0100 is the "#2 Weir Effluent" which is discharged to the canal also.

Washington Mills Electro – Minerals
Niagara Falls

		CONCENTRATIONS					LOADINGS kg/d		
ATG	PARAMETER	RMDL	UNIT	CO 0100	CO 0200	IN 1200	CO 0100	CO 0200	IN 1200
c	Total suspended solids	5	mg/L	5.78	5.05	5.98	40.8	51.4	107
c	Hydrogen ion (pH)			7.82	7.85	7.76			
c	Specific conductance		uS/cm	286	284	282			
c	DOC	0.5	mg/L	3	3.55	7.77	19.9	38.9	140
c	TOC	5	mg/L	3.07	3.92	1.08	23.5	37.6	19.4
c	Oil and grease	1	mg/L	1.06	1.24	0.974	8.24	12.7	17.5
c	Ammonia plus Ammonium	0.25	mg/L	0.038	0.033		0.317	0.342	
c	Nitrate+Nitrite	0.25	mg/L	0.17	0.16		1.49	1.62	
c	Total Kjeldahl nitrogen	0.5	mg/L	0.65	0.65		5.2	7.59	
c	Total phosphorus	0.1	mg/L	0.07	0.076		0.553	0.782	
09	Aluminum	30	ug/L	147	138	176	1.09	1.31	3.16
09	Strontium	20	ug/L	145	141	127	1.12	1.46	2.28
10	Selenium	5	ug/L	4.5	3		0.042	0.029	
14	Phenolics (4AAP)	2	ug/L	2.33	2.73	1.36	0.019	0.031	0.024
15	Sulphide	20	ug/L	19.5	19.5		0.172	0.195	
19	Bis(2-ethylhexyl) phthalate	2.2	ug/L	3.45	1.65		0.028	0.017	
98	Ftflow		m3/d	7730	10200				
I1	Chloride	2	mg/L	14.5	15		129	149	
I3	Sulphate	5	mg/L	24	23.5		211	235	

Notes:

Flow and loadings values should be treated with caution; flow monitoring methods of unestablished accuracy were used.

CO0100 is the " Effluent from the Queen Lagoon". This discharges into the Welland River.
CO0200 is the "Effluent from the Old Lagoon" which is also discharged to the River.

Intake loadings are based on analytical data and on the sum of mean effluent flows.

Washington Mills
Niagara Falls

		CONCENTRATIONS				LOADINGS kg/d	
ATG	PARAMETER	RMDL	UNIT	CO 0100	IN 0400	CO 0100	IN 0400
c	Total suspended solids	5	mg/L	22.1	21.4	46.6	43.9
c	Hydrogen ion (pH)			7.44	7.13		
c	Specific conductance		uS/cm	5900	6190		
c	DOC	0.5	mg/L	2.11	1.9	4.48	3.9
c	TOC	5	mg/L	2.95	1.25	6.16	2.56
c	Oil and grease	1	mg/L	6.13	11.9	12.3	24.3
c	Ammonia plus Ammonium	0.25	mg/L	1.2		2.53	
c	Nitrate+Nitrite	0.25	mg/L	0.034		0.072	
c	Total Kjeldahl nitrogen	0.5	mg/L	2.2		4.61	
c	Total phosphorus	0.1	mg/L	0.066		0.134	
09	Aluminum	30	ug/L	67.8		0.144	
09	Boron	50	ug/L	808		1.61	
09	Strontium	20	ug/L	10700		21.1	
14	Phenolics (4AAP)	2	ug/L	5		0.01	
15	Sulphide	20	ug/L	130		0.267	
98	Ftflow		m3/d	2050			
I1	Chloride	2	mg/L	2230	2370	4530	4870
I2	Fluoride	0.1	mg/L	0.7	690	1.48	1.41
I3	Sulphate	5	mg/L	727	727	1480	1490

Notes

CO0100 is the "Final Effluent" which flows to the Welland River and Lake Ontario.

Flow and loading values should be treated with caution; a flow monitoring primary device with modified geometry and hydraulic arrangement and of unestablished accuracy was used.

Intake loadings displayed are based on mean discharge flow rate and intake wellwater analyses.

Welland Chemical

Sarnia

Once Through Cooling – Monitored Parameters Only.

				CONCENTRATIONS			LOADINGS kg/d		
ATG	PARAMETER	RMDL	UNIT	OT 0300	OT 0400	OT 0500	OT 0300	OT 0400	OT 0500
c	Total suspended solids	5	mg/L	2.03	2.38	2.06	0.034	0.029	0.036
c	Hydrogen ion (pH)			7.27	7.37	7.37			
c	Specific conductance		uS/cm	186	186	186			
c	DOC	0.5	mg/L	1.39	1.56	1.44	0.024	0.018	0.025
c	TOC	5	mg/L	1.67	1.9	2.05	0.029	0.022	0.035
c	Oil and grease	1	mg/L	1.51	1.25	1.08	0.026	0.015	0.018
c	Total phosphorus	0.1	mg/L	0.100	0.100	0.100	0.002	0.001	0.002
98	Ftflow		m3/d	17	11.9	17.2			

Batch Discharges

				CONCENTRATIONS		LOADINGS kg/d	
ATG	PARAMETER	RMDL	UNIT	BA 0100	BA 0200	BA 0100	BA 0200
c	Total suspended solids	5	mg/L	28.6	10.4	3.5	1.74
c	Hydrogen ion (pH)			7.56	7.66		
c	Specific conductance		uS/cm	12600	6780		
c	DOC	0.5	mg/L	4.46	6.92	0.582	1.048
c	TOC	5	mg/L	5.02	13.8	0.602	1.940
c	Oil and grease	1	mg/L	1.43	1.89	0.187	0.348
c	Ammonia plus Ammonium	0.25	mg/L	2.47	0.999	0.264	0.145
c	Nitrate+Nitrite	0.25	mg/L	1.18	0.907	0.153	0.152
c	Total Kjeldahl nitrogen	0.5	mg/L	3.87	1.64	0.458	0.264
c	Total phosphorus	0.1	mg/L	0.079	0.084	0.01	0.014
09	Aluminum	30	ug/L	3710	443	0.467	0.068
09	Boron	50	ug/L	47.6	50.6	0.006	0.008
09	Cadmium	2	ug/L	4.29	4.1	0.001	–
09	Strontium	20	ug/L	1040	496	0.11	0.076
09	Zinc	10	ug/L	25.6	26.5	0.003	0.005
12	Mercury	0.1	ug/L	0.066	0.15	–	–
14	Phenolics (4AAP)	2	ug/L	21	76	0.003	0.015
15	Sulphide	20	ug/L	45	30	0.004	0.005
16	Chloroform	0.7	ug/L	54.6	90.7	0.007	0.018
16	Dibromochloromethane	1.1	ug/L	1.19	2.04	–	0.001
16	Methylene chloride	1.3	ug/L	1.71	0.86	–	–
17	o–Xylene	0.5	ug/L	0.429	0.53	–	–
19	Bis(2–ethylhexyl) phthalate	2.2	ug/L	1.4	2.75	–	0.001
19	Di–n–butyl phthalate	3.8	ug/L	1.1	2.9	–	0.001
20	Phenol	2.4	ug/L	1.35	1.8	–	–
23	Hexachlorobenzene	10	ng/L	20.1	13.2	–	–
23	Pentachlorobenzene	10	ng/L	3.64	9.16	–	–
24	Octachlorodibenzofuran	30	pg/L	26.5	22	–	–
98	Volume Discharged–Total		m3	127	163		
I1	Chloride	2	mg/L	6900	1950	558	390
I2	Fluoride	0.1	mg/L	0.1	0.3	0.01	0.064
I3	Sulphate	5	mg/L	4.5	22.5	0.554	4.59

Notes

OT0300 is the "Effluent from the Chlorine Filling Unit"; OT 0400 and 0500 are the "Effluents from the Aluminun Chloride Building, respectively the East and South Walls ".

BA0100 and BA0200 are the "Effluents from the South and #1 Lagoons" respectively.
Batch discharges were infrequent and figures are averaged over days when discharge was made.

All discharges follow local run–off/surface drainage conduits to the St. Clair River.

Loadings for intake are calculated from analytical figures and from the sum of the OT flows.

APPENDIX C

Storm Water and Waste Disposal Site Effluent

Explanatory Notes

- All data have been rounded to two figures except for loadings which have been rounded to one figure.

- **"Volume Discharged - Total"** is the arithmetic mean concentration of the parameter calculated over the total number of reported storm water discharges.

- **"N"** means the total number of storm water samples reported.

- **"ND"** means the number of detections above the RMDL.

- **"Minimum"** and **"Maximum"** are the minimum and maximum concentration values reported over the twelve month monitoring period respectively.

- **"Loading"** is expressed in kg/day and calculated from the product of the total volume discharged and the mean concentration value.

- **"Mean"** is the arithmetic mean concentration of the parameter calculated over the total number of data points.

Albright Wilson, Storm Stream ST0200. "Storm Culvert".

ATG	PARAMETER	RMDL	UNIT	N	ND	MINIMUM	MAXIMUM	MEAN	LOADING
c	Total suspended solids	5	mg/L	13	13	12	440	170	2
c	Hydrogen ion (pH)			13	13	7.3	8.5	7.9	
c	Specific conductance		uS/cm	13	13	330	2300	980	
c	DOC	0.5	mg/L	11	11	2.2	25	10	0.1
c	TOC	5	mg/L	11	10	3.7	24	11	0.1
c	Oil and grease	1	mg/L	10	3	1	2	1.3	0.02
c	Ammonia plus Ammonium	0.25	mg/L	11	2	0.052	1.3	0.25	0.003
c	Nitrate+Nitrite	0.25	mg/L	11	10	0.25	2.2	0.85	0.01
c	Total Kjeldahl nitrogen	0.5	mg/L	11	11	0.74	3.6	1.7	0.02
c	Total phosphorus	0.1	mg/L	13	13	1.4	220	37	0.5
09	Aluminum	30	ug/L	11	11	1900	40000	14000	0.2
09	Boron	50	ug/L	10	4	13	83	41	0.0005
09	Chromium	20	ug/L	11	4	9	52	21	0.0003
09	Copper	10	ug/L	11	8	3	38	18	0.0002
09	Strontium	20	ug/L	10	10	96	770	220	0.003
09	Vanadium	30	ug/L	11	4	3.8	70	24	0.0003
09	Zinc	10	ug/L	11	11	20	420	99	0.001
12	Mercury	0.1	ug/L	11	6	0.056	450	41	0.0005
98	Volume Discharged–Total		m3	13	13	1.8	22	13	

Albright & Wilson, Storm Stream ST0300. "Sidall Street".

ATG	PARAMETER	RMDL	UNIT	N	ND	MINIMUM	MAXIMUM	MEAN	LOADING
c	Total suspended solids	5	mg/L	12	12	6	1000	190	20
c	Hydrogen ion (pH)			12	12	7	8.8	7.6	
c	Specific conductance		uS/cm	12	12	280	950	570	
c	DOC	0.5	mg/L	11	11	4	13	8.1	0.8
c	TOC	5	mg/L	11	10	4.2	14	8.8	0.8
c	Oil and grease	1	mg/L	11	6	1	5	1.8	0.2
c	Ammonia plus Ammonium	0.25	mg/L	10	2	0.027	0.58	0.16	0.02
c	Nitrate+Nitrite	0.25	mg/L	11	8	0.07	1.7	0.64	0.06
c	Total Kjeldahl nitrogen	0.5	mg/L	11	10	0.32	1.7	1	0.1
c	Total phosphorus	0.1	mg/L	12	12	0.74	7.9	3	0.3
09	Aluminum	30	ug/L	11	11	730	31000	8600	800
09	Strontium	20	ug/L	8	8	190	580	300	0.03
09	Zinc	10	ug/L	11	11	60	370	180	0.02
98	Volume Discharged–Total		m3	12	12	26	190	95	

Allied Chemical, Storm Stream ST0200. "Mailloux Quarry".

ATG	PARAMETER	RMDL	UNIT	N	ND	MINIMUM	MAXIMUM	MEAN	LOADING
c	Total suspended solids	5	mg/L	12	12	10	190	37	300
c	Hydrogen ion (pH)			12	12	7	7.8	7.4	
c	Specific conductance		uS/cm	12	12	8800	320000	49000	
c	DOC	0.5	mg/L	12	9	0.1	47	8.5	70
c	TOC	5	mg/L	9	5	1.1	49	11	90
c	Oil and grease	1	mg/L	11	5	1	4	1.9	20
c	Ammonia plus Ammonium	0.25	mg/L	12	12	0.58	14	5.9	50
c	Nitrate+Nitrite	0.25	mg/L	12	11	0.04	3.5	0.97	8
c	Total Kjeldahl nitrogen	0.5	mg/L	12	12	0.85	15	8.1	70
c	Total phosphorus	0.1	mg/L	12	10	0.01	0.44	0.17	1
09	Aluminum	30	ug/L	12	12	60	1100	420	3
09	Boron	50	ug/L	12	10	20	4200	1600	10
09	Strontium	20	ug/L	12	12	2200	72000	22000	200
09	Zinc	10	ug/L	12	4	10	270	36	0.3
12	Mercury	0.1	ug/L	12	5	0.1	0.6	0.18	0.001
98	Volume Discharged–Total		m3	12	12	720	22000	8300	
I3	Sulphate	5	mg/L	12	12	300	1100	760	6000

Allied Chemicals, Storm Stream ST0500. "East Road Drain".

ATG	PARAMETER	RMDL	UNIT	N	ND	MINIMUM	MAXIMUM	MEAN	LOADING
c	Total suspended solids	5	mg/L	12	12	7	460	80	10
c	Hydrogen ion (pH)			12	12	6.4	7.9	7.4	
c	Specific conductance		uS/cm	12	12	220	12000	2000	
c	DOC	0.5	mg/L	12	12	1.3	19	5.1	0.8
c	TOC	5	mg/L	11	8	3.9	19	7.1	1
c	Oil and grease	1	mg/L	12	9	1	15	4.5	0.7
c	Total phosphorus	0.1	mg/L	12	6	0.01	0.55	0.14	0.02
09	Aluminum	30	ug/L	12	11	20	2500	490	0.07
09	Boron	50	ug/L	12	9	20	2200	680	0.1
09	Cadmium	2	ug/L	12	7	1	170	18	0.003
09	Chromium	20	ug/L	12	8	20	270	93	0.01
09	Molybdenum	20	ug/L	12	6	20	150	57	0.009
09	Strontium	20	ug/L	12	12	170	15000	2200	0.3
09	Zinc	10	ug/L	12	11	10	1700	630	0.09
10	Arsenic	5	ug/L	12	12	14	4100	410	0.06
98	FTFLOW		m3/d	12	12	31	490	150	
I1	Chloride	2	mg/L	12	12	24	6100	790	100

Columbian Storm Stream ST0100. "West Outfall".

ATG	PARAMETER	RMDL	UNIT	N	ND	MINIMUM	MAXIMUM	MEAN	LOADING
c	Total suspended solids	5	mg/L	13	13	9	200	68	20
c	Hydrogen ion (pH)			13	13	7.3	8.1	7.8	
c	Specific conductance		uS/cm	13	13	450	1300	730	
c	DOC	0.5	mg/L	13	13	2.1	11	6.7	2
c	TOC	5	mg/L	12	12	5.1	11	8	2
c	Oil and grease	1	mg/L	13	13	2.8	11	4.7	1
c	Ammonia plus Ammonium	0.25	mg/L	13	11	0.17	4.2	1.3	0.3
c	Nitrate+Nitrite	0.25	mg/L	13	13	0.68	1.5	1.1	0.3
c	Total Kjeldahl nitrogen	0.5	mg/L	13	13	0.7	6.7	2.1	0.5
c	Total phosphorus	0.1	mg/L	13	5	0.069	0.45	0.14	0.04
09	Aluminum	30	ug/L	13	13	280	4200	1400	0.4
09	Boron	50	ug/L	13	13	62	330	180	0.05
09	Copper	10	ug/L	13	10	5	46	16	0.004
09	Strontium	20	ug/L	13	13	140	450	290	0.08
09	Zinc	10	ug/L	13	13	52	700	190	0.05
14	Phenolics (4AAP)	2	ug/L	13	12	1	110	14	0.004
15	Sulphide	20	ug/L	13	11	19	1100	210	0.05
98	FTFLOW		m3/d	13	9	31	850	260	
I1	Chloride	2	mg/L	13	13	16	130	54	10
I3	Sulphate	5	mg/L	13	13	80	260	160	40

Columbian, Storm Stream ST0200. "East Outfall".

ATG	PARAMETER	RMDL	UNIT	N	ND	MINIMUM	MAXIMUM	MEAN	LOADING
c	Total suspended solids	5	mg/L	13	13	20	88	34	10
c	Hydrogen ion (pH)			13	13	7.1	8.3	7.6	
c	Specific conductance		uS/cm	13	13	510	1700	1000	
c	DOC	0.5	mg/L	13	13	3.5	15	7.8	2
c	TOC	5	mg/L	13	12	4.9	29	9.9	3
c	Oil and grease	1	mg/L	13	13	1.3	5.1	2.8	0.9
c	Ammonia plus Ammonium	0.25	mg/L	13	13	0.32	2.4	1.1	0.4
c	Nitrate+Nitrite	0.25	mg/L	13	13	0.48	1.3	0.78	0.2
c	Total Kjeldahl nitrogen	0.5	mg/L	13	13	1	3.1	1.7	0.5
c	Total phosphorus	0.1	mg/L	13	5	0.069	0.64	0.14	0.04
09	Aluminum	30	ug/L	13	13	170	1200	710	0.2
09	Boron	50	ug/L	13	13	96	280	170	0.05
09	Copper	10	ug/L	13	8	2	40	15	0.005
09	Strontium	20	ug/L	13	13	220	550	340	0.1
09	Zinc	10	ug/L	13	13	66	5500	550	0.2
14	Phenolics (4AAP)	2	ug/L	13	13	4	1100	150	0.05
15	Sulphide	20	ug/L	13	11	19	1600	330	0.1
98	FTFLOW		m3/d	13	13	1	1200	320	
I1	Chloride	2	mg/L	13	13	24	210	93	30
I3	Sulphate	5	mg/L	13	13	96	430	270	90

Cyanamid Welland, Storm Stream ST0500. "River Pumphouse Runoff".

ATG	PARAMETER	RMDL	UNIT	N	ND	MINIMUM	MAXIMUM	MEAN	LOADING
c	Total suspended solids	5	mg/L	12	12	39	380	160	300
c	Hydrogen ion (pH)			12	12	6.8	7.9	7.4	
c	Specific conductance		uS/cm	12	12	300	3300	1200	
c	DOC	0.5	mg/L	12	12	3.8	12	7	10
c	TOC	5	mg/L	12	12	5.3	17	8.9	20
c	Oil and grease	1	mg/L	12	5	1	2	1.3	2
c	Ammonia plus Ammonium	0.25	mg/L	12	12	4.1	40	13	20
c	Nitrate+Nitrite	0.25	mg/L	12	12	15	92	38	70
c	Total Kjeldahl nitrogen	0.5	mg/L	12	12	3.6	47	15	30
c	Total phosphorus	0.1	mg/L	12	11	0.03	2.2	0.61	1
09	Aluminum	30	ug/L	12	12	800	6700	2900	5
09	Boron	50	ug/L	12	8	28	92	60	0.1
09	Copper	10	ug/L	12	10	6	82	23	0.04
09	Strontium	20	ug/L	12	12	240	1200	540	1
09	Zinc	10	ug/L	12	12	21	160	67	0.1
10	Selenium	5	ug/L	12	9	3	24	9.3	0.02
14	Phenolics (4AAP)	2	ug/L	12	4	0.3	5	2.3	0.004
25	Cyanide Total	0.005	mg/L	12	11	0.003	0.099	0.035	0.06
98	Volume Discharged–Total		m3	12	12	18	13000	1800	

Cyanamid Welland, Storm Stream ST0600. "First Avenue – Surface".

ATG	PARAMETER	RMDL	UNIT	N	ND	MINIMUM	MAXIMUM	MEAN	LOADING
c	Total suspended solids	5	mg/L	12	12	29	1100	350	300
c	Hydrogen ion (pH)			12	12	6.9	7.8	7.6	
c	Specific conductance		uS/cm	12	12	210	830	510	
c	DOC	0.5	mg/L	12	12	3.7	13	9	8
c	TOC	5	mg/L	12	12	7	23	12	10
c	Oil and grease	1	mg/L	12	12	1.4	67	23	20
c	Ammonia plus Ammonium	0.25	mg/L	12	8	0.04	1.4	0.5	0.4
c	Nitrate+Nitrite	0.25	mg/L	12	11	0.18	12	2.9	2
c	Total Kjeldahl nitrogen	0.5	mg/L	12	11	0.41	9.9	2.4	2
c	Total phosphorus	0.1	mg/L	12	10	0.03	4.3	0.83	0.7
09	Aluminum	30	ug/L	12	12	1200	13000	5600	5
09	Copper	10	ug/L	12	7	4	36	17	0.01
09	Molybdenum	20	ug/L	12	7	3	380	96	0.08
09	Strontium	20	ug/L	12	12	94	360	260	0.2
09	Zinc	10	ug/L	12	12	24	300	88	0.08
14	Phenolics (4AAP)	2	ug/L	12	5	0.3	9	3.5	0.003
27	PCBT	0.1	ug/L	12	4	0.01	0.42	0.14	0.0001
98	Volume Discharged–Total		m3	12	12	4	8200	860	

Cyanamid Welland, Storm Stream ST0700, "First Avenu. – In–ground".

ATG	PARAMETER	RMDL	UNIT	N	ND	MINIMUM	MAXIMUM	MEAN	LOADING
c	Total suspended solids	5	mg/L	12	12	31	860	190	70
c	Hydrogen ion (pH)			12	12	7.2	8.1	7.7	
c	Specific conductance		uS/cm	12	12	270	1100	630	
c	DOC	0.5	mg/L	12	12	2.9	17	7.8	3
c	TOC	5	mg/L	12	11	4.8	11	7.7	3
c	Oil and grease	1	mg/L	12	7	1	2.4	1.5	0.5
c	Ammonia plus Ammonium	0.25	mg/L	12	10	0.18	2.9	1.4	0.5
c	Nitrate+Nitrite	0.25	mg/L	12	12	3.5	18	13	5
c	Total Kjeldahl nitrogen	0.5	mg/L	12	11	0.5	5.8	2.8	1
c	Total phosphorus	0.1	mg/L	12	11	0.03	1.7	0.68	0.2
09	Aluminum	30	ug/L	12	12	1300	14000	3700	1
09	Copper	10	ug/L	12	12	15	150	44	0.02
09	Lead	30	ug/L	12	4	10	88	31	0.01
09	Molybdenum	20	ug/L	12	12	38	280	130	0.05
09	Strontium	20	ug/L	12	12	190	1400	620	0.2
09	Zinc	10	ug/L	12	11	7	150	56	0.02
14	Phenolics (4AAP)	2	ug/L	12	6	0.2	6	2.5	0.0009
27	PCBT	0.1	ug/L	12	10	0.05	1.2	0.42	0.0001
98	Volume Discharged–Total		m3	12	12	8	1300	350	

Cyanamid Welland, Storm Stream ST0800. "Third Avenue".

ATG	PARAMETER	RMDL	UNIT	N	ND	MINIMUM	MAXIMUM	MEAN	LOADING
c	Total suspended solids	5	mg/L	9	9	180	2500	930	100
c	Hydrogen ion (pH)			9	9	6.8	7.6	7.3	
c	Specific conductance		uS/cm	9	9	130	1600	890	
c	DOC	0.5	mg/L	9	9	6.9	19	15	2
c	TOC	5	mg/L	9	9	10	24	18	2
c	Oil and grease	1	mg/L	9	7	1	2.5	1.6	0.2
c	Ammonia plus Ammonium	0.25	mg/L	9	9	0.47	6.9	3.6	0.4
c	Nitrate+Nitrite	0.25	mg/L	9	9	2.4	37	17	2
c	Total Kjeldahl nitrogen	0.5	mg/L	9	9	1.7	12	6.8	0.7
c	Total phosphorus	0.1	mg/L	9	9	0.16	5.2	2.3	0.3
09	Aluminum	30	ug/L	9	9	4200	78000	26000	3
09	Boron	50	ug/L	9	5	16	150	76	0.008
09	Copper	10	ug/L	9	9	15	140	58	0.006
09	Lead	30	ug/L	9	9	120	1200	490	0.05
09	Molybdenum	20	ug/L	9	9	32	780	270	0.03
09	Nickel	20	ug/L	9	6	2	140	55	0.006
09	Strontium	20	ug/L	9	9	62	780	450	0.05
09	Zinc	10	ug/L	9	9	220	3200	900	0.1
10	Arsenic	5	ug/L	9	5	0.5	26	10	0.001
25	Cyanide Total	0.005	mg/L	9	8	0.005	0.037	0.019	0.000002
98	Volume Discharged–Total		m3	9	9	6	780	110	

Cyanamid Welland, Storm Stream ST0900. "Fourth Avenue".

ATG	PARAMETER	RMDL	UNIT	N	ND	MINIMUM	MAXIMUM	MEAN	LOADING
c	Total suspended solids	5	mg/L	12	12	8	5200	850	80
c	Hydrogen ion (pH)			12	12	7.1	8.1	7.8	
c	Specific conductance		uS/cm	12	12	170	870	630	
c	DOC	0.5	mg/L	12	12	5.1	24	15	1
c	TOC	5	mg/L	10	10	8.4	25	18	2
c	Oil and grease	1	mg/L	12	4	1	2	1.2	0.1
c	Ammonia plus Ammonium	0.25	mg/L	12	5	0.07	1	0.31	0.03
c	Nitrate+Nitrite	0.25	mg/L	12	12	0.82	11	4.7	0.4
c	Total Kjeldahl nitrogen	0.5	mg/L	12	12	0.6	11	3.6	0.3
c	Total phosphorus	0.1	mg/L	12	11	0.03	10	1.3	0.1
09	Aluminum	30	ug/L	12	12	2800	98000	16000	1
09	Boron	50	ug/L	12	4	16	100	45	0.004
09	Copper	10	ug/L	12	12	13	340	61	0.006
09	Lead	30	ug/L	12	8	3	860	130	0.01
09	Molybdenum	20	ug/L	12	12	110	380	220	0.02
09	Nickel	20	ug/L	12	5	2	160	31	0.003
09	Strontium	20	ug/L	12	12	110	760	360	0.03
09	Zinc	10	ug/L	12	12	22	2400	350	0.03
14	Phenolics (4AAP)	2	ug/L	12	5	0.2	21	6	0.0005
25	Cyanide Total	0.005	mg/L	12	6	0.004	0.008	0.006	0.0000005
98	Volume Discharged–Total		m3	12	12	2	840	91	

Cyanamid Welland, Storm Stream ST1000. "Fifth Avenue West".

ATG	PARAMETER	RMDL	UNIT	N	ND	MINIMUM	MAXIMUM	MEAN	LOADING
c	Total suspended solids	5	mg/L	10	10	44	220	100	20
c	Hydrogen ion (pH)			10	10	7.3	7.9	7.7	0
c	Specific conductance		uS/cm	10	10	270	1700	600	0
c	DOC	0.5	mg/L	10	10	2.7	12	5.6	1
c	TOC	5	mg/L	10	9	5	12	7.4	2
c	Oil and grease	1	mg/L	10	5	1	1.8	1.2	0.3
c	Ammonia plus Ammonium	0.25	mg/L	10	10	2.5	8.1	4.6	1
c	Nitrate+Nitrite	0.25	mg/L	10	10	10	42	18	4
c	Total Kjeldahl nitrogen	0.5	mg/L	10	10	1.3	8.9	4.9	1
c	Total phosphorus	0.1	mg/L	10	9	0.08	0.79	0.49	0.1
09	Aluminum	30	ug/L	10	10	440	4200	2100	0.5
09	Copper	10	ug/L	10	4	6	27	11	0.003
09	Molybdenum	20	ug/L	10	7	16	46	31	0.007
09	Strontium	20	ug/L	10	10	200	860	410	0.09
09	Zinc	10	ug/L	10	10	20	11478	61	0.01
98	Volume Discharged–Total		m3	10	10	3	770	230	

Cyanamid Welland, Storm Stream ST1100. "Fifth Avenue East".

ATG	PARAMETER	RMDL	UNIT	N	ND	MINIMUM	MAXIMUM	MEAN	LOADING
c	Total suspended solids	5	mg/L	12	12	40	2800	480	100
c	Hydrogen ion (pH)			12	12	6.9	8.1	7.7	
c	Specific conductance		uS/cm	12	12	400	6800	1900	
c	DOC	0.5	mg/L	12	12	3	12	6.6	2
c	TOC	5	mg/L	12	12	5.2	12	7.9	2
c	Oil and grease	1	mg/L	12	6	1	3.2	1.7	0.4
c	Ammonia plus Ammonium	0.25	mg/L	12	8	0.07	8.1	2	0.5
c	Nitrate+Nitrite	0.25	mg/L	12	12	7.3	38	23	6
c	Total Kjeldahl nitrogen	0.5	mg/L	12	12	0.6	12	4.5	1
c	Total phosphorus	0.1	mg/L	12	11	0.07	3.6	0.61	0.2
09	Aluminum	30	ug/L	12	12	620	140000	16000	4
09	Boron	50	ug/L	12	4	18	300	63	0.02
09	Copper	10	ug/L	12	9	8	2000	180	0.05
09	Lead	30	ug/L	12	11	10	2700	290	0.07
09	Molybdenum	20	ug/L	12	12	26	120	69	0.02
09	Strontium	20	ug/L	12	12	170	2800	680	0.2
09	Zinc	10	ug/L	12	12	17	4700	510	0.1
14	Phenolics (4AAP)	2	ug/L	12	6	0.2	9	3.7	0.0009
25	Cyanide Total	0.005	mg/L	12	9	0.002	0.027	0.009	0.000002
98	Volume Discharged–Total		m3	12	12	1	1200	250	

Cyanamid Welland, Storm Stream ST1200. "Lab. Sewer".

ATG	PARAMETER	RMDL	UNIT	N	ND	MINIMUM	MAXIMUM	MEAN	LOADING
c	Total suspended solids	5	mg/L	12	12	11	160	54	8
c	Hydrogen ion (pH)			12	12	7.4	7.9	7.7	
c	Specific conductance		uS/cm	12	12	320	7000	1300	
c	DOC	0.5	mg/L	12	12	1.9	28	7.8	1
c	TOC	5	mg/L	11	10	4.5	30	9.3	1
c	Oil and grease	1	mg/L	12	8	1	4.1	2	0.3
c	Ammonia plus Ammonium	0.25	mg/L	12	9	0.12	1.1	0.41	0.06
c	Nitrate+Nitrite	0.25	mg/L	12	12	0.4	2.9	1.5	0.2
c	Total Kjeldahl nitrogen	0.5	mg/L	12	11	0.22	3.1	1.8	0.3
c	Total phosphorus	0.1	mg/L	12	11	0.09	0.56	0.27	0.04
09	Aluminum	30	ug/L	12	12	320	2600	1500	0.2
09	Strontium	20	ug/L	12	12	160	960	340	0.05
09	Zinc	10	ug/L	12	11	4	180	74	0.01
12	Mercury	0.1	ug/L	12	6	0.01	100	8.5	0.001
14	Phenolics (4AAP)	2	ug/L	12	7	0.3	7	3.4	0.0005
25	Cyanide Total	0.005	mg/L	12	4	0.002	0.017	0.005	0.000001
98	Volume Discharged–Total		m3	12	12	25	480	150	

ETI, Storm Stream ST0300. "West Storm".

ATG	PARAMETER	RMDL	UNIT	N	ND	MINIMUM	MAXIMUM	MEAN	LOADING
c	Total suspended solids	5	mg/L	12	2	4.2	33	6.9	2
c	Hydrogen ion (pH)			12	12	6.4	7.4	7	
c	Specific conductance		uS/cm	12	12	230	490	320	
c	DOC	0.5	mg/L	12	12	5.4	13	8.4	2
c	TOC	5	mg/L	2	2	8.4	17	13	3
c	Oil and grease	1	mg/L	12	6	0.96	4.2	1.4	0.4
c	Ammonia plus Ammonium	0.25	mg/L	12	12	9	31	16	4
c	Nitrate+Nitrite	0.25	mg/L	12	12	7.5	41	18	5
c	Total Kjeldahl nitrogen	0.5	mg/L	12	12	8.7	31	18	5
c	Total phosphorus	0.1	mg/L	12	2	0.069	0.12	0.08	0.02
09	Aluminum	30	ug/L	12	12	84	960	450	0.1
09	Strontium	20	ug/L	12	12	32	52	42	0.01
09	Zinc	10	ug/L	12	11	4	160	71	0.02
98	Ftflow		m3/d	12	12	9.5	510	250	

ETI, Storm Stream ST0400. "Cooks Creek".

ATG	PARAMETER	RMDL	UNIT	N	ND	MINIMUM	MAXIMUM	MEAN
c	Total suspended solids	5	mg/L	12	10	4.2	14	8.8
c	Hydrogen ion (pH)			12	12	6.4	7.4	6.9
c	Specific conductance		uS/cm	12	12	120	320	190
c	DOC	0.5	mg/L	12	12	5.2	20	11
c	TOC	5	mg/L	1	1	9.4	9.4	9.4
c	Oil and grease	1	mg/L	12	7	0.96	2.4	1.3
c	Ammonia plus Ammonium	0.25	mg/L	12	6	0.06	1.3	0.5
c	Nitrate+Nitrite	0.25	mg/L	12	12	0.32	5.8	1.7
c	Total Kjeldahl nitrogen	0.5	mg/L	12	12	0.52	2.2	1.3
c	Total phosphorus	0.1	mg/L	12	3	0.069	0.14	0.087
09	Aluminum	30	ug/L	12	12	290	740	490
09	Strontium	20	ug/L	12	12	48	150	86
98	Ftflow		m3/day	12	12	790	20000	9000

ETI, Storm Stream ST0500. "Beaver Pond".

ATG	PARAMETER	RMDL	UNIT	N	ND	MINIMUM	MAXIMUM	MEAN
c	Total suspended solids	5	mg/L	12	2	4.2	550	50
c	Hydrogen ion (pH)			12	12	6.1	7.7	6.8
c	Specific conductance		uS/cm	12	12	53	90	77
c	DOC	0.5	mg/L	12	12	7.1	20	12
c	TOC	5	mg/L	2	2	7.8	12	9.9
c	Oil and grease	1	mg/L	12	3	0.96	4.6	1.4
c	Ammonia plus Ammonium	0.25	mg/L	12	6	0.12	0.64	0.31
c	Nitrate+Nitrite	0.25	mg/L	12	8	0.082	0.83	0.36
c	Total Kjeldahl nitrogen	0.5	mg/L	12	11	0.38	3.4	1.2
c	Total phosphorus	0.1	mg/L	12	3	0.069	0.85	0.15
98	Ftflow		m3/day	12	12	240	1400	680

Nitrochem, Storm Stream ST0500. "Storm at Brockchem Road".

ATG	PARAMETER	RMDL	UNIT	N	ND	MINIMUM	MAXIMUM	MEAN
c	Total suspended solids	5	mg/L	15	15	7	700	130
c	Hydrogen ion (pH)			15	15	7	7.8	7.6
c	Specific conductance		uS/cm	15	15	750	2400	1500
c	DOC	0.5	mg/L	15	15	5.3	22	12
c	TOC	5	mg/L	9	9	7.2	18	12
c	Oil and grease	1	mg/L	13	12	0.96	20	5.1
c	Ammonia plus Ammonium	0.25	mg/L	15	15	10	130	55
c	Nitrate+Nitrite	0.25	mg/L	15	15	16	160	91
c	Total Kjeldahl nitrogen	0.5	mg/L	15	15	8.2	200	72
c	Total phosphorus	0.1	mg/L	15	12	0.069	1.5	0.45
09	Aluminum	30	ug/L	14	14	60	13000	2000
09	Boron	50	ug/L	14	12	32	780	290
09	Copper	10	ug/L	14	11	8	59	34
09	Strontium	20	ug/L	14	14	98	250	170
09	Zinc	10	ug/L	14	14	17	300	80
98	Volume Discharged–Total		m3	15	15	12	18000	2800

Norton, Storm Stream ST0600. "Storm Sewer".

ATG	PARAMETER	RMDL	UNIT	N	ND	MINIMUM	MAXIMUM	MEAN	LOADING
c	Total suspended solids	5	mg/L	12	11	3	330	82	70
c	Hydrogen ion (pH)			10	10	7.8	9.7	8.4	
c	Specific conductance		uS/cm	11	11	290	3300	1600	
c	DOC	0.5	mg/L	12	12	2	6.1	4	3
c	TOC	5	mg/L	9	3	2.5	6.3	4.1	3
c	Oil and grease	1	mg/L	12	8	1	22	4	3
c	Ammonia plus Ammonium	0.25	mg/L	12	8	0.025	0.75	0.38	0.3
c	Nitrate+Nitrite	0.25	mg/L	12	12	0.5	1.7	1	0.8
c	Total Kjeldahl nitrogen	0.5	mg/L	12	11	0.35	2.6	1.2	1
c	Total phosphorus	0.1	mg/L	12	8	0.01	4.3	0.53	0.4
09	Aluminum	30	ug/L	12	12	120	33000	15000	10
09	Boron	50	ug/L	12	12	130	1300	570	0.5
09	Chromium	20	ug/L	12	9	14	54	32	0.03
09	Copper	10	ug/L	12	11	2	240	76	0.06
09	Lead	30	ug/L	12	9	20	250	110	0.09
09	Molybdenum	20	ug/L	12	10	10	110	43	0.04
09	Strontium	20	ug/L	12	12	170	1100	420	0.3
09	Vanadium	30	ug/L	12	8	6.1	700	180	0.1
09	Zinc	10	ug/L	12	12	18	390	160	0.1
12	Mercury	0.1	ug/L	12	5	0.08	0.4	0.15	0.0001
98	Volume Discharged–Total		m3	9	9	300	1300	820	
I3	Sulphate	5	mg/L	12	12	80	520	210	200

Partek, Storm Stream ST0100. "East Storm".

ATG	PARAMETER	RMDL	UNIT	N	ND	MINIMUM	MAXIMUM	MEAN	LOADING
c	Total suspended solids	5	mg/L	12	11	2	640	200	70
c	Hydrogen ion (pH)			12	12	7.2	8	7.5	
c	Specific conductance		uS/cm	12	12	170	960	400	
c	DOC	0.5	mg/L	12	12	2.9	12	6.7	2
c	TOC	5	mg/L	11	11	8.5	50	22	7
c	Oil and grease	1	mg/L	12	8	0.89	6	2.6	0.9
c	Ammonia plus Ammonium	0.25	mg/L	12	12	0.35	1.9	0.79	0.3
c	Nitrate+Nitrite	0.25	mg/L	11	11	0.54	2.2	1.4	0.5
c	Total Kjeldahl nitrogen	0.5	mg/L	12	12	0.56	3.6	2.2	0.7
c	Total phosphorus	0.1	mg/L	12	7	0.06	1.1	0.23	0.08
09	Aluminum	30	ug/L	12	12	170	7600	2800	0.9
09	Boron	50	ug/L	12	5	12	100	49	0.02
09	Copper	10	ug/L	12	11	8	120	48	0.02
09	Strontium	20	ug/L	12	12	40	330	180	0.06
09	Zinc	10	ug/L	12	11	7.5	610	270	0.09
14	Phenolics (4AAP)	2	ug/L	12	7	0.8	11	3.6	0.001
98	Volume Discharged–Total		m3	12	12	150	630	330	
I3	Sulphate	5	mg/L	12	12	19	92	52	20

Partek, Storm Stream ST0200. "West Drain".

ATG	PARAMETER	RMDL	UNIT	N	ND	MINIMUM	MAXIMUM	MEAN	LOADING
c	Total suspended solids	5	mg/L	12	11	2	140	35	2
c	Hydrogen ion (pH)			12	12	6.8	7.9	7.4	
c	Specific conductance		uS/cm	12	12	92	710	200	10
c	DOC	0.5	mg/L	12	12	3.5	16	6.8	0.4
c	TOC	5	mg/L	7	7	8.2	20	12	0.7
c	Oil and grease	1	mg/L	12	11	0.89	4.8	2.4	0.1
c	Ammonia plus Ammonium	0.25	mg/L	12	11	0.14	2.1	0.91	0.05
c	Nitrate+Nitrite	0.25	mg/L	12	12	0.44	3	1.2	0.07
c	Total Kjeldahl nitrogen	0.5	mg/L	12	12	0.86	6.5	2.6	0.2
c	Total phosphorus	0.1	mg/L	12	3	0.06	0.25	0.089	0.005
09	Aluminum	30	ug/L	12	11	29	600	180	0.01
09	Strontium	20	ug/L	12	10	17	290	48	0.003
14	Phenolics (4AAP)	2	ug/L	12	10	1.2	33	11	0.0006
98	Volume Discharged–Total		m3	12	12	27	110	59	
I3	Sulphate	5	mg/L	12	12	8.3	110	35	2

Partek, Storm Stream ST0400. "Raw Material Run–off".

ATG	PARAMETER	RMDL	UNIT	N	ND	MINIMUM	MAXIMUM	MEAN	LOADING
c	Total suspended solids	5	mg/L	12	12	10	1300	380	4
c	Hydrogen ion (pH)			12	12	7.4	8.1	7.8	
c	Specific conductance		uS/cm	12	12	240	1300	820	
c	DOC	0.5	mg/L	12	12	6.3	14	10	0.1
c	TOC	5	mg/L	11	11	9.1	140	31	0.3
c	Oil and grease	1	mg/L	12	5	0.89	3	1.3	0.01
c	Ammonia plus Ammonium	0.25	mg/L	12	9	0.12	1.1	0.48	0.005
c	Nitrate+Nitrite	0.25	mg/L	11	8	0.1	3.9	1.2	0.01
c	Total Kjeldahl nitrogen	0.5	mg/L	12	12	1.1	6.1	2.1	0.02
c	Total phosphorus	0.1	mg/L	12	10	0.06	1.1	0.38	0.004
09	Zinc	10	ug/L	12	12	23	510	160	0.002
10	Arsenic	5	ug/L	12	4	1.6	70	11	0.0001
98	Volume Discharged–Total		m3	13	13	5	21	10	
I3	Sulphate	5	mg/L	12	11	2.6	390	140	1

UCAR Carbon, Storm Stream ST0400. "Union St. Effluent".

ATG	PARAMETER	RMDL	UNIT	N	ND	MINIMUM	MAXIMUM	MEAN	LOADING
c	Total suspended solids	5	mg/L	13	13	45	430	160	90
c	Hydrogen ion (pH)			13	13	8.1	11	9.6	
c	Specific conductance		uS/cm	13	13	180	2900	750	400
c	DOC	0.5	mg/L	13	13	3.2	60	12	6
c	TOC	5	mg/L	13	13	6.3	66	16	9
c	Oil and grease	1	mg/L	13	13	1.2	15	7.4	4
c	Total phosphorus	0.1	mg/L	13	8	0.069	1.1	0.27	0.1
09	Aluminum	30	ug/L	13	13	260	12000	2300	1
09	Chromium	20	ug/L	13	11	6	96	43	0.02
09	Copper	10	ug/L	13	10	6	48	18	0.01
09	Strontium	20	ug/L	13	13	100	680	350	0.2
09	Zinc	10	ug/L	13	12	8	500	160	0.09
14	Phenolics (4AAP)	2	ug/L	13	13	3	50	9	0.005
98	Volume Discharged–Total		m3	11	11	210	1500	540	

UCAR Carbon, Welland. Waste Disposal Site Effluent Stream WA0500.

ATG	PARAMETER	RMDL	UNIT	N	ND	MINIMUM	MAXIMUM	MEAN	LOADING
c	Total suspended solids	5	mg/L	12	9	4.2	300	64	300
c	Hydrogen ion (pH)			12	12	7.3	8.4	7.8	
c	Specific conductance		uS/cm	12	12	440	1200	850	
c	DOC	0.5	mg/L	12	12	6	20	12	50
c	TOC	5	mg/L	10	10	7.3	36	17	70
c	Oil and grease	1	mg/L	12	12	1.2	14	3.5	10
c	Total phosphorus	0.1	mg/L	12	6	0.069	0.82	0.17	0.7
09	Aluminum	30	ug/L	12	12	190	4400	1600	7
09	Boron	50	ug/L	12	11	24	300	170	0.7
09	Chromium	20	ug/L	12	4	3	58	18	0.07
09	Copper	10	ug/L	12	6	4	84	19	0.08
09	Strontium	20	ug/L	12	12	280	2600	1300	5
09	Zinc	10	ug/L	12	12	30	220	83	0.3
14	Phenolics (4AAP)	2	ug/L	12	9	1	17	5.1	0.02
98	Volume Discharged–Total		m3	6	6	890	13000	4100	

UCAR Carbon, Storm Stream ST0600. "Townline Ditch".

ATG	PARAMETER	RMDL	UNIT	N	ND	MINIMUM	MAXIMUM	MEAN	LOADING
c	Total suspended solids	5	mg/L	13	13	19	280	89	200
c	Hydrogen ion (pH)			13	13	8	11	9.2	
c	Specific conductance		uS/cm	13	13	400	1900	800	
c	DOC	0.5	mg/L	13	13	4.4	11	7.5	20
c	TOC	5	mg/L	13	12	4.4	14	8.9	20
c	Oil and grease	1	mg/L	13	12	0.96	8.2	2.5	6
c	Total phosphorus	0.1	mg/L	13	3	0.069	0.26	0.092	0.2
09	Aluminum	30	ug/L	13	13	88	3800	1100	3
09	Boron	50	ug/L	13	10	34	120	75	0.2
09	Chromium	20	ug/L	13	13	26	100	49	0.1
09	Strontium	20	ug/L	13	13	640	1800	1200	3
09	Zinc	10	ug/L	13	12	10	84	39	0.09
14	Phenolics (4AAP)	2	ug/L	13	12	1	12	6	0.01
98	Volume Discharged–Total		m3	11	11	850	6700	2400	

Washington Electro–Minerals, Storm Stream ST0800. "21" to Pell Creek".

ATG	PARAMETER	RMDL	UNIT	N	ND	MINIMUM	MAXIMUM	MEAN	LOADING
c	Total suspended solids	5	mg/L	10	10	18	1100	290	100
c	Hydrogen ion (pH)			11	11	7.8	9.4	8.3	
c	Specific conductance		uS/cm	10	10	280	820	490	
c	DOC	0.5	mg/L	11	11	1.5	16	4.5	2
c	TOC	5	mg/L	11	4	1.9	15	4.9	2
c	Oil and grease	1	mg/L	11	10	0.96	9.2	3.1	1
c	Total phosphorus	0.1	mg/L	11	6	0.01	0.86	0.21	0.09
09	Aluminum	30	ug/L	10	10	820	48000	12000	5
09	Boron	50	ug/L	10	10	110	9200	2900	1
09	Chromium	20	ug/L	10	7	13	940	160	0.07
09	Copper	10	ug/L	10	8	9	260	87	0.04
09	Lead	30	ug/L	11	8	10	860	270	0.1
09	Strontium	20	ug/L	11	11	120	640	210	0.09
09	Zinc	10	ug/L	11	11	11	580	190	0.08
98	Volume Discharged–Total		m3	11	11	110	1200	420	

Washington Electro–Minerals, Storm Stream ST0900. "18" to Stanley Ave. Sewer".

ATG	PARAMETER	RMDL	UNIT	N	ND	MINIMUM	MAXIMUM	MEAN	LOADING
c	Total suspended solids	5	mg/L	10	10	23	690	220	40
c	Hydrogen ion (pH)			10	10	7.5	8.5	8.1	
c	Specific conductance		uS/cm	10	10	67	3400	890	
c	DOC	0.5	mg/L	10	10	2	38	7	1
c	TOC	5	mg/L	10	6	3	42	8.9	2
c	Oil and grease	1	mg/L	10	10	2.1	46	12	2
c	Total phosphorus	0.1	mg/L	10	4	0.013	0.52	0.15	0.03
09	Aluminum	30	ug/L	10	10	280	17000	6500	1
09	Boron	50	ug/L	10	9	42	1200	410	0.08
09	Chromium	20	ug/L	10	6	3	150	53	0.01
09	Copper	10	ug/L	10	7	5	590	110	0.02
09	Lead	30	ug/L	10	6	10	780	230	0.04
09	Strontium	20	ug/L	10	9	19	360	130	0.02
09	Zinc	10	ug/L	10	9	4	460	140	0.03
98	Volume Discharged–Total		m3	11	11	50	550	190	

Washington Mills, Storm Stream ST0200. "Storm".

ATG	PARAMETER	RMDL	UNIT	N	ND	MINIMUM	MAXIMUM	MEAN	LOADING
c	Total suspended solids	5	mg/L	12	12	5.5	150	51	40
c	Hydrogen ion (pH)			12	12	7.2	8.1	7.4	
c	Specific conductance		uS/cm	12	12	270	740	470	
c	DOC	0.5	mg/L	12	12	2.1	30	8.1	6
c	TOC	5	mg/L	11	8	2.9	32	9	7
c	Oil and grease	1	mg/L	12	6	0.96	18	3.8	3
c	Total phosphorus	0.1	mg/L	12	3	0.013	0.23	0.1	0.08
09	Aluminum	30	ug/L	12	12	620	4800	1800	1
09	Boron	50	ug/L	12	12	100	740	320	0.2
09	Strontium	20	ug/L	12	12	190	1600	640	0.5
09	Zinc	10	ug/L	12	11	5	40	19	0.01
98	Volume Discharged–Total		m3	12	12	210	2300	780	

APPENDIX D

Ministry Inspection Data - Summary Comparison Tables

Explanatory Notes

- **"Mean"** is the arithmetic mean concentration of the parameter calculated over the total number of data points based on plant monitoring data.

- **"99'th PCTL"** is the 99'th percentile concentration value based on plant monitoring data.

- **"INSP. VAL"** is the concentration value for the Ministry inspection sample

Albright & Wilson

Port Maitland

CO 0100

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL	INSP. VAL.
c	Total suspended solids	5	mg/L	4.45	25.8	3.6
c	Specific conductance		uS/cm	327	468	335
c	DOC	0.5	mg/L	3.39	31	2.9
c	Oil and grease	1	mg/L	1.21	5	1
c	Nitrate+Nitrite	0.25	mg/L	0.37	1.15	0.35
c	Total phosphorus	0.1	mg/L	0.081	0.31	0.04
09	Aluminum	30	ug/L	583	19300	260
09	Strontium	20	ug/L	181	260	230
09	Zinc	10	ug/L	7.33	27.9	4
12	Mercury	0.1	ug/L	0.126	0.41	0.04
14	Phenolics (4AAP)	2	ug/L	3.83	19.6	0.6

Allied Chemicals

Amherstburg

PR 0100

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL	INSP. VAL.
c	Total suspended solids	5	mg/L	245	342	5.3
c	Specific conductance		uS/cm	3600	51300	358
c	DOC	0.5	mg/L	14.5	324	2.5
c	TOC	5	mg/L	22	342	3
c	Oil and grease	1	mg/L	2.93	14.9	1
c	Nitrate+Nitrite	0.25	mg/L	0.881	2.57	0.45
c	Total Kjeldahl nitrogen	0.5	mg/L	0.518	2.52	0.45
09	Aluminum	30	ug/L	485	3320	530
09	Boron	50	ug/L	1810	27600	1400
09	Cadmium	2	ug/L	9.83	65.8	3
09	Chromium	20	ug/L	29.2	88	1
09	Copper	10	ug/L	15	88	24
09	Strontium	20	ug/L	607	2800	240
09	Zinc	10	ug/L	71	470	57
10	Antimony	5	ug/L	249	4730	34
10	Arsenic	5	ug/L	203	5910	16
12	Mercury	0.1	ug/L	0.296	5.2	0.01
14	Phenolics (4AAP)	2	ug/L	5.98	43.7	1.3
16	Carbon tetrachloride	1.3	ug/L	736	3260	175
16	Chloroform	0.7	ug/L	4610	79000	1050
16	Methylene chloride	1.3	ug/L	389	3110	170
16	Trichlorofluoromethane	1	ug/L	1240	12800	90
17	Toluene	0.5	ug/L	102	103	2
19	Bis(2-ethylhexyl) phthalate	2.2	ug/L	15.9	113	1
23	1,2,4-Trichlorobenzene	10	ng/L	1080	14800	40
23	Hexachlorobenzene	10	ng/L	2030	31900	180
23	Hexachlorobutadiene	10	ng/L	205	484	20
23	Hexachlorocyclopentadiene	10	ng/L	325	439	20
23	Hexachloroethane	10	ng/L	1090	9690	700
23	Octachlorostyrene	10	ng/L	92.8	1120	20
I1	Chloride	2	mg/L	488	4200	57.1
I2	Fluoride	0.1	mg/L	49.1	904	1.88
I3	Sulphate	5	mg/L	54.8	160	24.6

Allied Chemicals
Amherstburg

PR 0300

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL.	INSP. VAL.
c	Total suspended solids	5	mg/L	25.7	133	19
c	Specific conductance		uS/cm	7600	10956	8690
c	DOC	0.5	mg/L	3.07	39.9	2.6
c	Oil and grease	1	mg/L	3.68	18.2	0
c	Total Kjeldahl nitrogen	0.5	mg/L	0.765	1.22	0.6
c	Total phosphorus	0.1	mg/L	0.549	3.4	1.04
09	Aluminum	30	ug/L	438	4040	110
09	Boron	50	ug/L	3610	49500	300
09	Cadmium	2	ug/L	8.67	38.4	9
09	Copper	10	ug/L	12.8	50	11
09	Molybdenum	20	ug/L	165	409	210
09	Nickel	20	ug/L	178	582	190
09	Strontium	20	ug/L	14800	37400	7600
09	Zinc	10	ug/L	215	1580	75
10	Antimony	5	ug/L	15.5	138	7
10	Arsenic	5	ug/L	188	3860	130
12	Mercury	0.1	ug/L	1.24	6.1	1.76
19	Bis(2–ethylhexyl) phthalate	2.2	ug/L	65.1	835	1
I1	Chloride	2	mg/L	1770	8430	1830
I2	Fluoride	0.1	mg/L	12.2	25.3	14.4
I3	Sulphate	5	mg/L	2020	4000	2120

Allied Chemicals
Amherstburg

PR 0600

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL.	INSP. VAL.
c	Specific conductance		uS/cm	361000	1200000	684000
c	Oil and grease	1	mg/L	2.35	4.4	0
09	Aluminum	30	ug/L	4860	56600	110
09	Boron	50	ug/L	5100	48800	230000
09	Cadmium	2	ug/L	11.8	104	5
09	Chromium	20	ug/L	52.5	369	26
09	Strontium	20	ug/L	245	391	470
09	Zinc	10	ug/L	55	190	76
10	Antimony	5	ug/L	67.8	231	98
10	Arsenic	5	ug/L	245	3500	35
16	Carbon tetrachloride	1.3	ug/L	3130	6250	50
16	Chloroform	0.7	ug/L	15500	76000	1220
16	Methylene chloride	1.3	ug/L	18500	65500	3350
16	Trichlorofluoromethane	1	ug/L	88700	370000	100
17	Toluene	0.5	ug/L	2360	2350	20
19	Bis(2–ethylhexyl) phthalate	2.2	ug/L	14.1	19	3
23	1,2,3–Trichlorobenzene	10	ng/L	18400	448	1
23	1,2,4–Trichlorobenzene	10	ng/L	10900	24800	2
23	2,4,5–Trichlorotoluene	10	ng/L	13400	3260	1
23	Hexachloroethane	10	ng/L	18400	234000	1
I1	Chloride	2	mg/L	110000	287000	30400

Cabot Canada

Sarnia — CO0100

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL.	INSP. VAL.
c	Total suspended solids	5	mg/L	4.89	14.7	4.7
c	Specific conductance		uS/cm	739	1600	380
c	DOC	0.5	mg/L	3.05	13	2.1
c	Oil and grease	1	mg/L	1.36	10	0
c	Nitrate+Nitrite	0.25	mg/L	0.605	1.48	0.4
c	Total Kjeldahl nitrogen	0.5	mg/L	0.51	1.67	0.25
09	Aluminum	30	ug/L	661	1600	733
09	Copper	10	ug/L	23.5	150	7
09	Strontium	20	ug/L	169	362	124
09	Zinc	10	ug/L	73.6	45	26
25	Cyanide Total	0.005	mg/L	0.004	0.04	0.001
I1	Chloride	2	mg/L	127	406	40.3

Cyanamid Canada

(Niagara Plant) — CO 0100

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL.	INSP. VAL.
c	Total suspended solids	5	mg/L	14.6	31	24
c	DOC	0.5	mg/L	4.15	6.94	2.7
c	Oil and grease	1	mg/L	1.28	3.34	3
c	Ammonia plus Ammonium	0.25	mg/L	0.618	2.77	0.2
c	Nitrate+Nitrite	0.25	mg/L	0.69	2.19	0.8
c	Total Kjeldahl nitrogen	0.5	mg/L	0.986	1.2	0.95
09	Aluminum	30	ug/L	278	591	920
09	Strontium	20	ug/L	172	200	210
09	Zinc	10	ug/L	20.4	59.5	15
25	Cyanide Total	0.005	mg/L	0.095	0.73	0.12

Cyanamid Canada

(Niagara Plant) — CO 0200

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL.	INSP. VAL.
c	Total suspended solids	5	mg/L	11.6	63.3	10
c	Specific conductance		uS/cm	273	313	318
c	DOC	0.5	mg/L	3.27	12.7	3.4
c	Oil and grease	1	mg/L	1.48	18	0
c	Nitrate+Nitrite	0.25	mg/L	0.587	1.71	0.55
c	Total Kjeldahl nitrogen	0.5	mg/L	0.667	2.1	0.45
09	Aluminum	30	ug/L	232	1008	730
09	Strontium	20	ug/L	146	166	160
09	Zinc	10	ug/L	17.3	140	9
25	Cyanide Total	0.005	mg/L	0.017	0.49	0.012

Cyanamid

(Welland Plant) CO0200

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL.	INSP. VAL.
c	Total suspended solids	5	mg/L	18.2	96.1	15.2
c	Specific conductance		uS/cm	512	897	485
c	DOC	0.5	mg/L	15.6	43	11.7
c	TOC	5	mg/L	15.5	42.4	13
c	Oil and grease	1	mg/L	2.01	12.2	0
c	Ammonia plus Ammonium	0.25	mg/L	8.16	18	11.2
c	Nitrate+Nitrite	0.25	mg/L	7.21	27.1	4.85
c	Total Kjeldahl nitrogen	0.5	mg/L	29.1	89.2	35.4
c	Total phosphorus	0.1	mg/L	0.846	2.8	0.4
09	Aluminum	30	ug/L	788	4530	540
09	Strontium	20	ug/L	234	403	200
09	Zinc	10	ug/L	14.3	59.8	12
10	Antimony	5	ug/L	5.17	17.6	1
14	Phenolics (4AAP)	2	ug/L	2.58	10.6	1.6
25	Cyanide Total	0.005	mg/L	0.097	0.61	0.01

Cyanamid

(Welland Plant) CO0400

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL.	INSP. VAL.
c	Total suspended solids	5	mg/L	32.7	322	67.9
c	Specific conductance		uS/cm	600	1220	653
c	DOC	0.5	mg/L	28.5	53	22
c	TOC	5	mg/L	29.4	64.4	25
c	Oil and grease	1	mg/L	1.47	8	1
c	Ammonia plus Ammonium	0.25	mg/L	16.8	46.9	38.1
c	Nitrate+Nitrite	0.25	mg/L	13.7	91	6.65
c	Total Kjeldahl nitrogen	0.5	mg/L	64.1	122	86.1
c	Total phosphorus	0.1	mg/L	2.63	7.49	2.02
09	Aluminum	30	ug/L	1130	4800	890
09	Strontium	20	ug/L	239	392	200
09	Zinc	10	ug/L	11.6	52.5	6
10	Antimony	5	ug/L	5.21	14.3	1
10	Arsenic	5	ug/L	5.79	24.9	2
14	Phenolics (4AAP)	2	ug/L	2.67	10.7	1.8
15	Sulphide	20	ug/L	37.3	50	4
17	Toluene	0.5	ug/L	2.11	29.4	0.2
2	Cyanide Total	0.005	mg/L	0.204	0.78	8
I1	Chloride	2	mg/L	46	100	28.2
I2	Fluoride	0.1	mg/L	0.425	0.5	0.94
I3	Sulphate	5	mg/L	107	177	73.4

ETI

North Bay OT 0100

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL.	INSP. VAL.
c	Total suspended solids	5	mg/L	11.8	40.2	4.8
c	Specific conductance		uS/cm	274	687	132
c	DOC	0.5	mg/L	6.76	12.5	5.1
c	TOC	5	mg/L	6.73	11.9	5
c	Oil and grease	1	mg/L	1.49	4.5	2
c	Ammonia plus Ammonium	0.25	mg/L	4.46	10.8	1.85
c	Nitrate+Nitrite	0.25	mg/L	9.38	43.5	4
c	Total Kjeldahl nitrogen	0.5	mg/L	5.18	11.1	2.55
c	Total phosphorus	0.1	mg/L	0.162	0.75	0.02

Exolon – Esk

Thorold

CO 0100

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL	INSP. VAL.
c	Total suspended solids	5	mg/L	19	28.3	28.2
c	Specific conductance		uS/cm	303	316	293
c	DOC	0.5	mg/L	3.3	27	2.2
c	TOC	5	mg/L	4.03	7.23	2
c	Total phosphorus	0.1	mg/L	0.137	0.43	0.04
09	Aluminum	30	ug/L	284	425	1200
09	Copper	10	ug/L	9.39	19	21
09	Strontium	20	ug/L	156	167	160

Fiberglas

Sarnia

CO 0100

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL	INSP. VAL.
c	Total suspended solids	5	mg/L	20.1	38.8	66.7
c	Specific conductance		uS/cm	253	468	243
c	DOC	0.5	mg/L	3.19	24.3	2.1
c	TOC	5	mg/L	4.07	28	4
c	Oil and grease	1	mg/L	1.2	2.02	0
c	Nitrate+Nitrite	0.25	mg/L	0.422	0.88	0.4
c	Total Kjeldahl nitrogen	0.5	mg/L	0.606	2.43	0.45
09	Aluminum	30	ug/L	139	247	48
09	Boron	50	ug/L	373	657	180
09	Strontium	20	ug/L	86	97.5	81
09	Zinc	10	ug/L	8.17	14	13
14	Phenolics (4AAP)	2	ug/L	4.37	13	3
2	Cyanide Total	0.005	mg/L	0.004	0.02	0.008

General Chemical

Amherstburg

CO 0100

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL	INSP. VAL.
c	Total suspended solids	5	mg/L	41.4	187	218
c	Specific conductance		uS/cm	59200	93900	86100
c	DOC	0.5	mg/L	221	1060	1.9
c	TOC	5	mg/L	321	1320	4
c	Oil and grease	1	mg/L	1.4	6.18	1
c	Ammonia plus Ammonium	0.25	mg/L	5.44	46.8	3.55
c	Nitrate+Nitrite	0.25	mg/L	0.831	2.7	0.5
c	Total Kjeldahl nitrogen	0.5	mg/L	5.87	10.2	7.5
c	Total phosphorus	0.1	mg/L	0.237	2.93	0.1
09	Aluminum	30	ug/L	168	430	480
09	Boron	50	ug/L	509	1060	580
09	Molybdenum	20	ug/L	167	517	45
09	Strontium	20	ug/L	4910	6900	3600
09	Zinc	10	ug/L	55	87.3	9
10	Arsenic	5	ug/L	18.7	122	1
12	Mercury	0.1	ug/L	0.203	0.88	0.11
14	Phenolics (4AAP)	2	ug/L	2.53	4.93	3.4
15	Sulphide	20	ug/L	50.1	401	2
16	Chloroform	0.7	ug/L	2.23	10.4	1
16	Trichlorofluoromethane	1	ug/L	13.5	49.8	1
2	Cyanide Total	0.005	mg/L	0.007	0.02	0.008
I1	Chloride	2	mg/L	47900	60700	35200

General Chemical

Amherstburg

CO 0200

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL	INSP. VAL
c	Total suspended solids	5	mg/L	28.2	184	48.8
c	Specific conductance		uS/cm	573	1090	563
c	DOC	0.5	mg/L	2.19	6.2	2.4
c	Oil and grease	1	mg/L	1.29	6	1
c	Ammonia plus Ammonium	0.25	mg/L	2.97	17.1	1.4
c	Nitrate+Nitrite	0.25	mg/L	1.15	2.92	0.4
c	Total Kjeldahl nitrogen	0.5	mg/L	3.28	17.3	1.85
c	Total phosphorus	0.1	mg/L	0.11	0.23	0.06
09	Aluminum	30	ug/L	475	1715	880
09	Copper	10	ug/L	10	10	18
09	Strontium	20	ug/L	137	194	150
12	Mercury	0.1	ug/L	0.117	0.36	0.02
14	Phenolics (4AAP)	2	ug/L	2.79	6	2.4
15	Sulphide	20	ug/L	23.1	150	11
2	Cyanide Total	0.005	mg/L	0.012	0.03	0.01
I1	Chloride	2	mg/L	99.1	256	88.3
I2	Fluoride	0.1	mg/l	0.11	0.17	0.12
I3	Sulphate	5	mg/L	23.2	33.5	21.1

ICI Canada

Cornwall

PR 0400

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL	INSP. VAL
c	Total suspended solids	5	mg/L	603	5200	40.3
c	Specific conductance		uS/cm	19700	56600	37400
c	DOC	0.5	mg/L	11.7	45.7	3
c	TOC	5	mg/L	14.2	33.6	3
c	Oil and grease	1	mg/L	9.15	67.7	1
c	Nitrate+Nitrite	0.25	mg/L	0.444	2.85	0.15
c	Total Kjeldahl nitrogen	0.5	mg/L	0.52	1.9	0.65
c	Total phosphorus	0.1	mg/L	0.715	3.4	0.7
09	Aluminum	30	ug/L	505	5650	230
09	Chromium	20	ug/L	25.8	153	5
09	Copper	10	ug/L	26.4	173	27
09	Lead	30	ug/L	150	1510	33
09	Molybdenum	20	ug/L	22.2	253	8
09	Nickel	20	ug/L	26	111	8
09	Strontium	20	ug/L	3860	15300	910
09	Vanadium	30	ug/L	67.7	338	67
09	Zinc	10	ug/L	97	627	16
10	Arsenic	5	ug/L	7.5	22.6	1
12	Mercury	0.1	ug/L	139	1383	210
14	Phenolics (4AAP)	2	ug/L	4.54	23.5	1
16	Chloroform	0.7	ug/L	19.3	194	10
16	Dibromochloromethane	1.1	ug/L	2.7	9.19	2
16	Methylene chloride	1.3	ug/L	4.56	16.7	1
23	1,2,3,4–Tetrachlorobenzene	10	ng/L	18.3	47.8	1
23	1,2,3,5–Tetrachlorobenzene	10	ng/L	8.63	25.9	1
23	1,2,3–Trichlorobenzene	10	ng/L	23.6	192	1
23	1,2,4,5–Tetrachlorobenzene	10	ng/L	13.1	34.9	1
23	1,2,4–Trichlorobenzene	10	ng/L	294	4320	10
23	2,4,5–Trichlorotoluene	10	ng/L	33.6	206	1
23	Hexachlorobenzene	10	ng/L	136	1403	1
23	Hexachlorobutadiene	10	ng/L	249	2624	6
23	Hexachlorocyclopentadiene	10	ng/L	39.1	283	1
23	Hexachloroethane	10	ng/L	949	11300	110
23	Octachlorostyrene	10	ng/L	56.2	495	1
23	Pentachlorobenzene	10	ng/L	80.8	668	1
2	Cyanide Total	0.005	mg/L	0.392	4.74	0.005
27	PCBT	0.1	ug/L	0.306	2.15	0.02
I1	Chloride	2	mg/L	16900	79600	13600
I2	Fluoride	0.1	mg/L	1.31	2.79	0.01
I3	Sulphate	5	mg/L	1310	2740	858

ICI Canada

Courtright CO 0200

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL.	INSP. VAL.
c	Total suspended solids	5	mg/L	6.56	10.2	6.7
c	Specific conductance		uS/cm	230	250	245
c	DOC	0.5	mg/L	2.72	5.5	2
c	Ammonia plus Ammonium	0.25	mg/L	1.17	2.65	0.45
c	Nitrate+Nitrite	0.25	mg/L	1.13	1.55	0.65
c	Total Kjeldahl nitrogen	0.5	mg/L	2	5.98	0.85

ICI Canada

Courtright PR 0300

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL.	INSP. VAL.
c	Total suspended solids	5	mg/L	37	237	23.5
c	Specific conductance		uS/cm	516	1260	299
c	DOC	0.5	mg/L	10.4	61.2	4.3
c	TOC	5	mg/L	11.3	197	4
c	Ammonia plus Ammonium	0.25	mg/L	26.1	125	11.5
c	Nitrate+Nitrite	0.25	mg/L	24.2	98.5	6.6
c	Total Kjeldahl nitrogen	0.5	mg/L	33	177	17.3
c	Total phosphorus	0.1	mg/L	0.36	2.05	0.08
09	Aluminum	30	ug/L	413	1450	580
09	Copper	10	ug/L	9.43	56.9	6
09	Strontium	20	ug/L	133	219	84
09	Zinc	10	ug/L	429	15400	9
14	Phenolics (4AAP)	2	ug/L	6.53	31.2	0.8
2	Cyanide Total	0.005	mg/L	0.011	0.04	0.001
I1	Chloride	2	mg/L	25.7	132	10.5
I2	Fluoride	0.1	mg/L	0.3	0.94	0.14
I3	Sulphate	5	mg/L	35.2	91.2	18.4

ICI Canada

Courtright CO 0500

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL.	INSP. VAL.
c	Total suspended solids	5	mg/L	7.61	32.8	9.7
c	Specific conductance		uS/cm	278	443	306
c	DOC	0.5	mg/L	3.21	7.79	2.9
c	Ammonia plus Ammonium	0.25	mg/L	2.36	11.7	0.8
c	Nitrate+Nitrite	0.25	mg/L	3.96	16.7	3.05
c	Total Kjeldahl nitrogen	0.5	mg/L	3.39	22.3	1.4
c	Total phosphorus	0.1	mg/L	0.214	0.88	0.2
09	Aluminum	30	ug/L	105	338	170
09	Strontium	20	ug/L	115	161	110
09	Zinc	10	ug/L	51.9	397	7
14	Phenolics (4AAP)	2	ug/L	30.9	262	1
16	Chloroform	0.7	ug/L	1.61	16.4	2
16	Chloromethane	3.7	ug/L	6.63	57.6	1
2	Cyanide Total	0.005	mg/L	0.007	0.01	0.001

ICI Canada

Courtright

OT 0600

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL.	INSP. VAL.
c	Total suspended solids	5	mg/L	5.91	7.54	10.2
c	Specific conductance		uS/cm	218	239	230
c	DOC	0.5	mg/L	1.81	2.56	1.6
c	Nitrate+Nitrite	0.25	mg/L	0.364	0.68	0.3
09	Aluminum	30	ug/L	79.6	143	200
09	Strontium	20	ug/L	98.3	105	90
09	Zinc	10	ug/L	22.8	53.6	5
I3	Sulphate	5	mg/L	17.677	25.7	16.3

ICI Canada

Courtright

CO 0700

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL.	INSP. VAL.
c	Total suspended solids	5	mg/L	5.96	28.1	8.3
c	Specific conductance		uS/cm	212	302	233
c	DOC	0.5	mg/L	3.05	11	1.8
c	Ammonia plus Ammonium	0.25	mg/L	1.39	33.8	0.3
c	Nitrate+Nitrite	0.25	mg/L	0.818	7.08	0.4
c	Total Kjeldahl nitrogen	0.5	mg/L	2.92	54.5	0.7
09	Aluminum	30	ug/L	89.8	297	170
09	Strontium	20	ug/L	98.5	124	89
09	Zinc	10	ug/L	23.1	244	2
14	Phenolics (4AAP)	2	ug/L	13.3	90	0.4
20	Phenol	2.4	ug/L	10.7	19.4	4.6
I1	Chloride	2	mg/L	9.2	14.9	10
I3	Sulphate	5	mg/L	16.9	21.1	16.6

ICI Canada

Courtright

CO 0800

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL.	INSP. VAL.
c	Total suspended solids	5	mg/L	11.4	74.6	15.4
c	Specific conductance		uS/cm	257	366	301
c	DOC	0.5	mg/L	6.94	24.6	6
c	TOC	5	mg/L	7.99	19.2	9
c	Ammonia plus Ammonium	0.25	mg/L	2.49	5.97	2.1
c	Nitrate+Nitrite	0.25	mg/L	0.652	4.49	0.3
c	Total Kjeldahl nitrogen	0.5	mg/L	3.01	7.35	2.5
09	Aluminum	30	ug/L	122	477	150
09	Strontium	20	ug/L	111	148	99
09	Zinc	10	ug/L	42	315	2
14	Phenolics (4AAP)	2	ug/L	13.8	57.3	0.6
I1	Chloride	2	mg/L	10.5	12.7	11.4
I3	Sulphate	5	mg/L	40.7	57.5	39.9

ICI

Conpac Plant — BA 0100

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL	INSP. VAL.
c	Total suspended solids	5	mg/L	83.4	462	21.9
c	Specific conductance		uS/cm	4900	22200	2540
c	DOC	0.5	mg/L	52.1	1085	4.1
c	TOC	5	mg/L	56.8	452	6
c	Oil and grease	1	mg/L	2.88	14.2	0
c	Ammonia plus Ammonium	0.25	mg/L	49.5	542	6.3
c	Nitrate+Nitrite	0.25	mg/L	56.9	1186	55.8
c	Total Kjeldahl nitrogen	0.5	mg/L	34.9	406	6.35
c	Total phosphorus	0.1	mg/L	6.63	102	0.04
09	Aluminum	30	ug/L	379	1550	96
09	Boron	50	ug/L	149	1020	50
09	Cadmium	2	ug/L	24	122	2
09	Chromium	20	ug/L	75.8	404	12
09	Copper	10	ug/L	679	7451	100
09	Nickel	20	ug/L	239	2520	49
09	Strontium	20	ug/L	288	630	160
09	Thallium	30	ug/L	36.2	90.4	30
09	Zinc	10	ug/L	187	1160	54
10	Antimony	5	ug/L	3.42	11	2
10	Arsenic	5	ug/L	6.15	34.8	1
10	Selenium	5	ug/L	13.8	117	1
11	Chromium (hexavalent)	10	ug/L	10.1	404	0
12	Mercury	0.1	ug/L	3.15	42.5	0.41
14	Phenolics (4AAP)	2	ug/L	10.4	47	2.6
16	Carbon tetrachloride	1.3	ug/L	27.9	406	5
16	Chloroform	0.7	ug/L	49.4	837	10
16	Dibromochloromethane	1.1	ug/L	2.86	107	0.5
16	Tetrachloroethylene	1.1	ug/L	2.55	8.9	2
23	1,2,3,4–Tetrachlorobenzene	10	ng/L	37.5	271	1
23	1,2,3,5–Tetrachlorobenzene	10	ng/L	10.3	79.6	1
23	1,2,3–Trichlorobenzene	10	ng/L	52.1	248	20
23	1,2,4,5–Tetrachlorobenzene	10	ng/L	20.8	82	1
23	1,2,4–Trichlorobenzene	10	ng/L	47.4	202	2
23	2,4,5–Trichlorotoluene	10	ng/L	39.7	162	1
23	Hexachlorobutadiene	10	ng/L	42.5	258	1
23	Hexachlorocyclopentadiene	10	ng/L	18.6	83.5	1
23	Hexachloroethane	10	ng/L	1690	17000	500
23	Octachlorostyrene	10	ng/L	17.2	126	1
23	Pentachlorobenzene	10	ng/L	35.3	175	10
I1	Chloride	2	mg/L	1380	8620	340
I3	Sulphate	5	mg/L	982	4470	451

IMC

Port Maitland — CO 0300

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL	INSP. VAL.
c	Total suspended solids	5	mg/L	7.76	18.2	6.4
c	Specific conductance		uS/cm	2860	3595	2120
c	DOC	0.5	mg/L	7.6	13.2	6.1
c	TOC	5	mg/L	6.91	8.9	8
c	Oil and grease	1	mg/L	1.06	1.83	2
c	Ammonia plus Ammonium	0.25	mg/L	1.09	8.2	1.4
c	Nitrate+Nitrite	0.25	mg/L	0.757	5.18	1.85
c	Total Kjeldahl nitrogen	0.5	mg/L	1.65	5.88	2.1
c	Total phosphorus	0.1	mg/L	0.645	1.43	1
09	Aluminum	30	ug/L	69	362	110
09	Boron	50	ug/L	87.5	131	2
09	Strontium	20	ug/L	823	1540	510
09	Zinc	10	ug/L	10.2	53.4	8
14	Phenolics (4AAP)	2	ug/L	8.75	50	7.4
I2	Fluoride	0.1	mg/L	9.48	15.4	11.6
I3	Sulphate	5	mg/L	1690	2440	1040

Linde

Moore — CO 0100

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL	INSP. VAL.
c	Total suspended solids	5	mg/L	8.78	35.7	21.1
c	Specific conductance		uS/cm	899	1150	557
c	DOC	0.5	mg/L	9.84	19.3	6.7
c	TOC	5	mg/L	11.8	20.2	10
c	Oil and grease	1	mg/L	2.48	11.2	0.05
c	Total phosphorus	0.1	mg/L	0.923	1.77	0.8
09	Aluminum	30	ug/L	303	1190	520
09	Boron	50	ug/L	746	9050	240
09	Chromium	20	ug/L	26.7	77	1
09	Copper	10	ug/L	45.8	80.9	19
09	Strontium	20	ug/L	549	844	180
09	Zinc	10	ug/L	121	398	260

Linde

Sarnia — CO 0100

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL	INSP. VAL.
c	Total suspended solids	5	mg/L	10.5	81.4	126
c	Specific conductance		uS/cm	876	1760	512
c	DOC	0.5	mg/L	10.6	18.9	5
c	TOC	5	mg/L	12.9	30.4	9
c	Oil and grease	1	mg/L	2.51	10.3	3
c	Total phosphorus	0.1	mg/L	1.06	3.720	2.26
09	Aluminum	30	ug/L	281	2470	2300
09	Boron	50	ug/L	854	8720	120
09	Copper	10	ug/L	134	505	21
09	Strontium	20	ug/L	489	748	200
09	Zinc	10	ug/L	454	1200	170

Linde

Sault Ste Marie — CO 0100

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL	INSP. VAL.
c	Total suspended solids	5	mg/L	19.3	99.7	17.1
c	Specific conductance		uS/cm	468	699	357
c	DOC	0.5	mg/L	9.55	47.1	8.9
c	TOC	5	mg/L	13.1	54.4	11
c	Oil and grease	1	mg/L	2.25	8.05	4
c	Total phosphorus	0.1	mg/L	1.07	2.98	1.04
09	Aluminum	30	ug/L	403	2270	250
09	Boron	50	ug/L	677	7480	2
09	Copper	10	ug/L	333	2600	1300
09	Strontium	20	ug/L	144	272	78
09	Zinc	10	ug/L	166	710	310

Liquid Carbonic

Maitland — CO 0100

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL	INSP. VAL.
c	Specific conductance		uS/cm	848	1000	771
c	DOC	0.5	mg/L	8.02	81.1	1.4
c	TOC	5	mg/L	9.25	70.1	2
c	Oil and grease	1	mg/L	2.88	15.4	3
09	Aluminum	30	ug/L	87.8	608	29
09	Boron	50	ug/L	195	399	200
09	Strontium	20	ug/L	1640	2580	1400
09	Zinc	10	ug/L	86.7	746	15

Liquid Carbonic

Courtright CO 0100

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL	INSP. VAL.
c	Specific conductance		uS/cm	217	460	237
c	DOC	0.5	mg/L	5.79	34	1.600
c	TOC	5	mg/L	5.89	34	2
c	Oil and grease	1	mg/L	2.52	15	1
09	Aluminum	30	ug/L	63.5	154	96
09	Strontium	20	ug/L	415	2170	95
09	Zinc	10	ug/L	14.5	65.3	6

Nitrochem

Maitland CO 0400

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL	INSP. VAL.
c	Total suspended solids	5	mg/L	199	1748	64.7
c	Specific conductance		uS/cm	3390	6970	2620
c	DOC	0.5	mg/L	32.5	160	18.3
c	TOC	5	mg/L	30.9	66.5	21
c	Oil and grease	1	mg/L	20.4	901	0
c	Ammonia plus Ammonium	0.25	mg/L	112	327	62.8
c	Nitrate+Nitrite	0.25	mg/L	92.4	325	39.6
c	Total Kjeldahl nitrogen	0.5	mg/L	122	384	70.5
c	Total phosphorus	0.1	mg/L	1.36	8	0.86
09	Aluminum	30	ug/L	594	4400	260
09	Boron	50	ug/L	106	238	51
09	Copper	10	ug/L	56.3	960	51
09	Strontium	20	ug/L	267	569	230
09	Vanadium	30	ug/L	200	3200	54
09	Zinc	10	ug/L	52.9	285	13
12	Mercury	0.1	ug/L	0.168	0.45	0.13
14	Phenolics (4AAP)	2	ug/L	85.5	370	20.8
15	Sulphide	20	ug/L	84.8	275	2
16	1,1–Dichloroethane	0.8	ug/L	1.08	2.82	0.5
16	1,1–Dichloroethylene	2.8	ug/L	1.88	5.52	0.8
16	Bromoform	3.7	ug/L	3.99	35	1
16	Chloroform	0.7	ug/L	2.95	14.4	2
16	Tetrachloroethylene	1.1	ug/L	44.5	125	25
16	Trans–1,2–Dichloroethylen	1.4	ug/L	6.13	16.9	0.5
16	Trichloroethylene	1.9	ug/L	2.35	7.27	1
20	Phenol	2.4	ug/L	13.8	98.8	25
2	Cyanide Total	0.005	mg/L	0.321	4.13	0.12
I1	Chloride	2	mg/L	97	250	183
I2	Fluoride	0.1	mg/L	0.27	0.57	0.24
I3	Sulphate	5	mg/L	518	1630	395

Norton

Niagara Falls CO0200

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL	INSP. VAL.
c	Total suspended solids	5	mg/L	16.7	117	5.4
c	Specific conductance		uS/cm	367	1130	376
c	DOC	0.5	mg/L	2.2	4.84	2.1
c	Oil and grease	1	mg/L	1.38	6	1
c	Total phosphorus	0.1	mg/L	0.188	2.12	0.02
09	Aluminum	30	ug/L	748	2991	190
09	Boron	50	ug/L	80.4	149	18
09	Strontium	20	ug/L	181	510	170
09	Zinc	10	ug/L	21.6	99.4	3.5
12	Mercury	0.1	ug/L	0.136	0.8	0.02

Norton

Niagara Falls

CO0300

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL	INSP. VAL
c	Total suspended solids	5	mg/L	18.8	95.6	42
c	Specific conductance		uS/cm	700	1740	627
c	DOC	0.5	mg/L	2.01	5.02	2.1
c	Oil and grease	1	mg/L	1.43	4.36	1
c	Ammonia plus Ammonium	0.25	mg/L	0.756	8.75	0.55
c	Nitrate+Nitrite	0.25	mg/L	0.25	0.6	0.2
c	Total Kjeldahl nitrogen	0.5	mg/L	0.976	4.55	0.75
09	Aluminum	30	ug/L	2150	17200	810
09	Boron	50	ug/L	45.4	118	6.5
09	Chromium	20	ug/L	14.8	61.3	1
09	Copper	10	ug/L	22.1	92.2	9
09	Strontium	20	ug/L	545	2460	530
09	Zinc	10	ug/L	26.5	152	6
I3	Sulphate	5	mg/L	237	728	201

Norton

Niagara Falls

CO0400

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL	INSP. VAL
c	Total suspended solids	5	mg/L	12.4	94.4	9.1
c	Specific conductance		uS/cm	330	640	304
c	DOC	0.5	mg/L	2.07	4.65	2
c	Oil and grease	1	mg/L	1.71	2.94	1
09	Aluminum	30	ug/L	1140	6510	400
09	Copper	10	ug/L	13	39.8	3
09	Strontium	20	ug/L	269	941	160
09	Zinc	10	ug/L	27.9	161	8

Sulco Chemicals

Elmira

CO 0100

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL	INSP. VAL
c	Total suspended solids	5	mg/L	14.8	41.5	6
c	Specific conductance		uS/cm	7570	14500	6030
c	DOC	0.5	mg/L	4.97	16.6	2.8
c	TOC	5	mg/L	7.83	18.1	5
c	Oil and grease	1	mg/L	2.26	14.4	1
c	Ammonia plus Ammonium	0.25	mg/L	0.257	1.25	0.05
c	Nitrate+Nitrite	0.25	mg/L	9.73	26.4	7.6
c	Total Kjeldahl nitrogen	0.5	mg/L	0.854	3.27	0.35
c	Total phosphorus	0.1	mg/L	0.664	1.58	0.94
09	Aluminum	30	ug/L	240	896	140
09	Boron	50	ug/L	173	561	480
09	Cadmium	2	ug/L	5.16	20.9	7
09	Cobalt	20	ug/L	16.5	67	9
09	Copper	10	ug/L	37	140	19
09	Lead	30	ug/L	33.9	238	60
09	Nickel	20	ug/L	38.1	190	22
09	Strontium	20	ug/L	6650	14500	2700
09	Vanadium	30	ug/L	53.2	613	16
09	Zinc	10	ug/L	1590	1340	390
10	Arsenic	5	ug/L	5.5	12	2
14	Phenolics (4AAP)	2	ug/L	3.57	39	3.8
15	Sulphide	20	ug/L	23.9	117	2
2	Cyanide Total	0.005	mg/L	0.03	0.18	0.004
I1	Chloride	2	mg/L	1830	4390	1220
I2	Fluoride	0.1	mg/L	4.07	27.2	1.2
I3	Sulphate	5	mg/L	1640	6920	1380

UCAR Carbon

Welland CO 0200

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL	INSP. VAL.
c	Total suspended solids	5	mg/L	5.81	34	2.3
c	Specific conductance		uS/cm	1260	3230	835
c	DOC	0.5	mg/L	7.34	81	3.7
c	Oil and grease	1	mg/L	2.09	7.2	1
c	Nitrate+Nitrite	0.25	mg/L	0.832	2.99	0.75
c	Total phosphorus	0.1	mg/L	0.09	0.29	0.04
09	Aluminum	30	ug/L	208	1260	150
09	Boron	50	ug/L	76.7	135	2
09	Strontium	20	ug/L	1000	1920	860
09	Zinc	10	ug/L	52.9	205	9.7
14	Phenolics (4AAP)	2	ug/L	4.58	19	1.4
I1	Chloride	2	mg/L	151	823	66
I3	Sulphate	5	mg/L	240	989	105

UCAR Carbon

Welland CO 0300

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL	INSP. VAL.
c	Specific conductance		uS/cm	370	670	324
c	DOC	0.5	mg/L	3.14	9.05	2
c	Oil and grease	1	mg/L	1.32	9.3	1
09	Aluminum	30	ug/L	179	684	130
09	Strontium	20	ug/L	324	990	220
09	Zinc	10	ug/L	40.6	374	5
14	Phenolics (4AAP)	2	ug/L	3	11.3	4.8
I1	Chloride	2	mg/L	21.3	86.7	18
I3	Sulphate	5	mg/L	52.6	253	31.3

Washington Mills Electro–Minerals

Niagara Falls CO 0100

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL	INSP. VAL.
c	Total suspended solids	5	mg/L	5.78	9.56	6.3
c	DOC	0.5	mg/L	3	12.1	2
c	Oil and grease	1	mg/L	1.06	2.5	2
09	Aluminum	30	ug/L	147	256	240
09	Strontium	20	ug/L	145	152	140
14	Phenolics (4AAP)	2	ug/L	2.33	6.3	1.6

Washington Mills Electro–Minerals

Niagara Falls CO 0200

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL	INSP. VAL.
c	Total suspended solids	5	mg/L	5.05	24.8	7.2
c	Specific conductance		uS/cm	284	318	284
c	DOC	0.5	mg/L	3.55	16.9	2.1
c	TOC	5	mg/L	3.92	13.7	3
c	Oil and grease	1	mg/L	1.24	8.5	5
09	Aluminum	30	ug/L	138	581	220
09	Strontium	20	ug/L	141	161	140
14	Phenolics (4AAP)	2	ug/L	2.73	10.6	2.4

Washington Mills

Niagara Falls — CO 0100

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL	INSP. VAL.
c	Total suspended solids	5	mg/L	22.1	29.7	8.7
c	Specific conductance		uS/cm	5900	6650	7930
c	DOC	0.5	mg/L	2.11	15.4	1.5
c	Oil and grease	1	mg/L	6.13	29.5	4
09	Aluminum	30	ug/L	67.8	414	290
09	Boron	50	ug/L	808	3700	2
09	Strontium	20	ug/L	10700	57000	10000
I1	Chloride	2	mg/L	2230	2860	2310
I3	Sulphate	5	mg/L	727	936	802

Welland Chemical

Sarnia — BA 0100

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL	INSP. VAL.
c	Specific conductance		uS/cm	12600	35500	9200
c	DOC	0.5	mg/L	4.46	30.4	4
c	Ammonia plus Ammonium	0.25	mg/L	2.47	6.3	1.9
c	Nitrate+Nitrite	0.25	mg/L	1.18	1.8	0.8
c	Total Kjeldahl nitrogen	0.5	mg/L	3.87	11.8	2.8
09	Aluminum	30	ug/L	3710	12800	7500
09	Boron	50	ug/L	47.6	135	2
09	Strontium	20	ug/L	1040	3290	860
09	Zinc	10	ug/L	25.6	84.7	35
16	Chloroform	0.7	ug/L	54.6	702	1
16	Methylene chloride	1.3	ug/L	1.71	6.95	0.5
23	Hexachlorobenzene	10	ng/L	20.1	30	1

Welland Chemical

Sarnia — BA 0200

ATG	PARAMETER	RMDL	UNIT	MEAN	99'th PCTL	INSP. VAL.
c	Total suspended solids	5	mg/L	10.4	32.5	43
c	Specific conductance		uS/cm	6780	19500	6250
c	DOC	0.5	mg/L	6.92	64.6	7
c	TOC	5	mg/L	13.8	148	8
c	Oil and grease	1	mg/L	1.89	9.52	1
c	Nitrate+Nitrite	0.25	mg/L	0.907	3.42	1.15
c	Total Kjeldahl nitrogen	0.5	mg/L	1.64	11.8	0.3
09	Aluminum	30	ug/L	443	2405	740
09	Boron	50	ug/L	50.6	97.8	2
09	Cadmium	2	ug/L	4.1	38.3	2
09	Strontium	20	ug/L	496	2550	61
09	Zinc	10	ug/L	26.5	208	1800
16	Chloroform	0.7	ug/L	90.7	1360	240
16	Dibromochloromethane	1.1	ug/L	2.04	7.3	4
17	o-Xylene	0.5	ug/L	0.53	1.27	0.2
23	Hexachlorobenzene	10	ng/L	13.2	79.6	100
23	Pentachlorobenzene	10	ng/L	9.16	42.5	1

Ministry Inspection and Plant Monitoring Data Summary for PCDDs and PCDFs

Company Name	Control Point	Isomer Group	RMDL	Sample frequency	Minimum Conc.	Maximum Conc.	Mean Conc.	Detects/ total	Inspection Value
Allied Chemical	PR0100	O8CDD	30	M	<20	340	123	5/7	130
		O8CDF	30	M	<20	1100	383	5/7	130
	PR0300	O8CDD	30	M	<20	65	33	2/11	<40
		O8CDF	30	M	<20	81	31	2/11	<40
	PR0600	O8CDD	30	Q	<30	420	133	3/4	
		T4CDD	20	Q	<10	50	25	1/4	
Cyanamid Canada (Welland plant)	CO0200	O8CDD	30	S	<20	430	225	1/2	55
	CO0400	O8CDD	30	S	<20	160	90	1/2	
	IN1500	O8CDD	30	S	<20	560	290	1/2	
General Chemical	CO0100	O8CDD	30	S	39	95	67	2/2	74
	CO0200	O8CDD	30	S	150	180	165	2/2	140
		H7CDD	30	S	<21	43	32	1/2	<12
		H6CDD	30	S	<20	45	32.5	1/2	<8
		H6CDF	20	S	<20	93	56.5	1/2	<8
		P5CDD	20	S	<20	47	33.5	1/2	<11
		P5CDF	15	S	29	230	130	2/2	36
		T4CDF	15	S	220	330	275	2/2	400
	IN0600	O8CDD	30	S	110	120	115	2/2	
		P5CDD	20	S	<20	36	28	1/2	
ICI (Cornwall)	PR0400	O8CDF	30	M	<22	3700	761	9/12	<3
		H7CDF	30	M	<20	4700	1140	9/12	<5
		H6CDD	30	M	<22	190	60	4/12	<4
		H6CDF	20	M	<15	5200	1210	9/12	<3
		P5CDD	20	M	<19	3400	476	5/12	<3
		P5CDF	15	M	<13	12000	2900	9/12	<2
		T4CDD	20	M	<11	520	75	5/12	<2
		T4CDF	15	M	<8	30000	7620	9/12	220
	CO0300	O8CDF	30	Q	<22	340	113	3/4	
		H6CDF	20	Q	<15	700	206	2/4	
		P5CDD	20	Q	<19	50	27	1/4	
		P5CDF	15	Q	<13	2400	674	2/4	
		T4CDF	15	Q	<8	2400	997	3/4	
ICI (Conpac)	BA0100	O8CDD	30	S	45	540	293	2/2	39
		O8CDF	30	S	56	180	118	2/2	14

Ministry Inspection and Plant Monitoring Data Summary for PCDDs and PCDFs

Company Name	Control Point	Isomer Group	RMDL	Sample frequency	Minimum Conc.	Maximum Conc.	Mean Conc.	Detects/ total	Inspection Value
IMC	CO0300	O8CDD	30	S	<20	62	41	1/2	<20
Linde (Moore)	CO0100	O8CDD	30	S	<30	82	56	1/2	120
		O8CDF	30	S	<30	120	75	1/2	<14
Linde (Sarnia)	CO0100	O8CDD	30	S	580	590	585	2/2	330
		O8CDF	30	S	<30	79	54	1/2	23
		H7CDD	30	S	67	170	118	2/2	48
		H7CDF	30	S	<25	51	38	1/2	30
		H6CDD	30	S	<20	42	31	1/2	<3
		H6CDF	20	S	<20	29	24	1/2	<1
Linde (Sault)	CO0100	O8CDD	30	S	2700	62000	32300	2/2	6200
		O8CDF	30	S	<30	540	285	1/2	67
		H7CDD	30	S	340	10000	5170	2/2	790
		H7CDF	30	S	<25	720	372	1/2	160
		H6CDD	30	S	<20	920	470	1/2	140
		H6CDF	20	S	<20	580	300	1/2	69
		P5CDD	20	S	<20	80	50	1/2	<7
Nitrochem	CO0400	O8CDD	30	M	<20	1500	760	12/13	1100
		O8CDF	30	M	<22	81	37	6/13	<10
		H7CDD	30	M	<17	530	220	11/13	<20
		H7CDF	30	M	<20	170	63	8/13	<50
		H6CDF	20	M	<15	74	24	4/13	<20
UCAR Carbon	CO0200	O8CDD	30	S	<20	42	31	1/2	<8
	CO0300	O8CDD	30	S	<20	53	36	1/2	9

Notes:

All concentration values are in picograms per litre.

Chlorinated dibenzo-p-dioxins and dibenzofurans are identified by the stems CDD and CDF.
Octa, hepta, hexa, penta and tetra chlorine substituted isomer mixtures are identified by O8, H7, H6, P5, and T4 prefixes.

Blank boxes in the inspection values column indicate that no inspection result is available for that particular stream at the plant site. Only selected streams were sampled/analyzed for PCDD/PCDF content by the ministry because of limited laboratory capacity.

"Sample Frequency" shows the number of samplings/analyses legally required; "M" is monthly, "Q" is quarterly and "S" indicates semi-annually.

APPENDIX E-1

Reported Data Remark Code Summary

REPORTED DATA REMARK CODE SUMMARY

<	Actual amount less than reported
< DL	Reported value = MDL
< T	A measurable trace amount
< W	No measurable response (zero)
< WE	No measurable response (sample dilution)
?	Questionable data
IM	Interference because of sample matrix
A	Approximate value
AR	Attached report
N/A	No data will be reported
AIS	Approximate value due to insufficient sample volume
I	Interference suspected
>	Actual amount probably greater than reported
OLD	Old, sample exceeds maximum storage time
UQC	Data unreliable, possible lab QA/QC problems
SIP	Sample improperly preserved
UCR	Data unreliable, could not confirm by reanalysis
IB	Background interference
IC	Interference from colour
!IN	No data, insufficient sample volume due to inspection

APPENDIX E-2

Summary of Available Provincial Water Quality Objectives/Guidelines - July 1992

SUMMARY OF AVAILABLE PWQO/G – JULY 1992

SUBSTANCE	CAS NUMBER	EMPPL LIST.	PWQO STATUS	VALUE (μg/L)
1,1,2,2–tetrachloroethane	79345	/87	PROPOSED PWQG	50
1,1,2–trichloroethane	79005	/87	PROPOSED PWQG	800
1,1–dichloroethane	75343	/87	PROPOSED PWQG	200
1,1–dichloroethylene	75354	/87	PROPOSED PWQG	40
1,2,3,4–tetrachlorobenzene	634662	/87	PWQO	0.1
1,2,3,5–tetrachlorobenzene	634902	/87	PWQO	0.1
1,2,3–trichlorobenzene	87616	/87	PWQO	0.9
1,2,4,5–tetrachlorobenzene	95943	/87	PWQO	0.15
1,2,4–trichlorobenzene	120821	/87	PWQO	0.5
1,2–dichlorobenzene	95501	/87	PWQO	2.5
1,2–dichloroethane	107062	/87	PROPOSED PWQG	90
1,3–dichlorobenzene	541731	/87	PWQO	2.5
1,4–dichlorobenzene	106467	/87	PWQO	4
1–methylnaphthalene	90120	/87	PROPOSED PWQG	2
2,3,4,5–tetrachlorophenol	4901513	/87	PWQO	1
2,3,4,6–tetrachlorophenol	58902	/87	PWQO	1
2,3,4–trichlorophenol	15950660	/87	PWQO	18
2,3,5,6–tetrachlorophenol	935955	/87	PWQO	1
2,3,5–trichlorophenol	933788	/87	PWQO	18
2,3,7,8–tetrachlorodibenzo–p–dioxin	1746016	/87	PROPOSED PWQG	0.1 pg/L
2,4,5–trichlorophenol	95954	/87	PWQO	18
2,4,6–trichlorophenol	88062	/87	PWQO	18
2,4–dichlorophenol	120832	/87	PWQO	0.2
2,4–dimethylphenol	105679	/87	PROPOSED PWQG	10.5
2,4–dinitrotoluene	121142	/87	PROPOSED PWQG	4
2,6–dichlorophenol	87650	/87	PWQO	0.2
2,6–dimethylphenol	576261	/88	PROPOSED PWQG	8.4
2,6–dinitrotoluene	606202	/87	PROPOSED PWQG	3
2–methylnaphthalene	91576	/87	PROPOSED PWQG	2
2–nitrophenol	88755	/88	PROPOSED PWQG	0.5
3,4–dimethylphenol	95658	/88	PROPOSED PWQG	17.5
4,6–dinitro–o–cresol	534521	/87	PROPOSED PWQG	0.2
4–nitrophenol	100027	/87	PROPOSED PWQG	48
abietic acid	514103	/87	PWQG (j)	(a), (j)
aluminum	7429905	/87	PWQG	(a)
aniline	62533	/87	PROPOSED PWQG	2
antimony	7440360	/87	PROPOSED PWQG	7
Aroclor 1016*	12674112	/87	PWQO (j)	(j)
Aroclor 1221*	11104282	/87	PWQO (j)	(j)
Aroclor 1232*	11141165	/87	PWQO(j)	(j)
Aroclor 1242*	53469219	/87	PWQO (j)	(j)
Aroclor 1248*	12672296	/87	PWQO (j)	(j)
Aroclor 1254*	11097691	/87	PWQO (j)	(j)
Aroclor 1260*	11096825	/87	PWQO (j)	(j)

1) SUMMARY OF AVAILABLE PWQO/G – JULY 1992

SUBSTANCE	CAS NUMBER	EMPPL LIST.	PWQO STATUS	VALUE (µg/L)
arsenic	7440382	/87	PWQO	100
benzene	71432	/87	PROPOSED PWQG	100
beryllium	7440417	/87	PWQO	(a)
bis(2–ethylhexyl)phthalate	117817	/87	PWQO (f)	(f)
cadmium	7440439	/87	PWQO	0.2
cadmium (revised)	7440439	/87	PROPOSED PWQO	(a)
chlorobenzene (monochlorobenzene)	108907	/87	PWQO	15
chromium	7440473	/87	PWQO	100
cis–1,2–dichloroethylene	156592	/87	PROPOSED PWQG	200
cobalt	7440484	/87	PROPOSED PWQG	0.4
copper	7440508	/87	PWQO	5
copper (revised)	7440508	/87	PROPOSED PWQO	(a)
dehydroabietic acid	1740198	/87	PWQG	(a)
Di–n–butylphthalate	84742	/87	PWQO (g)	(g)
di–n–octylphthalate	117840	/88	PWQO	(h)
diethylphthalate (DEP)	84662	/88	PWQO	(h)
dimethylphenols (Isomer Nonspecific)	1300716	/88	PROPOSED PWQG	(c)
dimethylphthalate	131113	/89	PWQO	(h)
ethylbenzene	100414	/88	PROPOSED PWQG	8
hexachlorobenzene	118741	/87	PWQO	0.0065
hexachlorobutadiene	87683	/87	PROPOSED PWQG	0.02
hydrogen sulphide	7783064	/88	PWQO	2
isopimaric acid	5835267	/87	PWQG (j)	(a), (j)
lead	7439921	/87	PWQO	(a)
lead (revised)	7439921	/87	PROPOSED PWQO	(a)
levopimaric acid	79549	/87	PWQG (j)	(a), (j)
Lindane (gamma – 1,2,3,4,5,6–hexachlorocyclohexane)	58899	/88	PWQO	0.01
m–cresol	108394	/87	PROPOSED PWQG	1
m–xylene	108383	/87	PROPOSED PWQG	2
mercury	7439976	/87	PWQO	0.2
neoabietic acid	471772	/87	PWQG (j)	(a), (j)
nickel	7440020	/87	PWQO	25
nitrobenzene	98953	/88	PROPOSED PWQG	0.02
o–chlorophenol (2–chlorophenol)	95578	/87	PWQO	(d)
o–cresol	95487	/87	PROPOSED PWQG	1
o–xylene	95476	/87	PROPOSED PWQG	0.7
p–cresol	106445	/87	PROPOSED PWQG	1
p–xylene	106423	/87	PROPOSED PWQG	30
pentachlorobenzene	608935	/87	PWQO	0.03
pentachlorophenol	87865	/87	PWQO	0.5
phenols	108952	/87	PWQO	1
pimaric acid	127275	/87	PWQG (j)	(a), (j)
selenium	7782492	/87	PWQO	100
silver	7440224	/87	PWQO	0.1

SUMMARY OF AVAILABLE PWQO/G – JULY 1992

SUBSTANCE	CAS NUMBER	EMPPL LIST.	PWQO STATUS	VALUE (μg/L)
STRONTIUM	7440246	/88	PROPOSED PWQG	7
Styrene	100425	/87	PROPOSED PWQG	20
Tetrachloroethylene	127184	/87	PROPOSED PWQG	50
Tetraethyl lead	78002	/87	PROPOSED PWQG	0.0009
Thallium	7440280	/87	PROPOSED PWQG	0.2
Toluene	108883	/87	PROPOSED PWQG	0.8
trans-1,2-Dichloroethylene	156605	/87	PROPOSED PWQG	200
Trichloroethylene	79016	/87	PROPOSED PWQG	2
Triethyl lead		/87	PROPOSED PWQG	0.4
Vanadium	7440622	/87	PROPOSED PWQG	7
Zinc	7440666	/87	PWQO	30
Zinc	7440666	/87	PROPOSED PWQG	16

LEGEND

(a) PWQO/G is either a narrative, or dependent on pH, alkalinity, or hardness; see Blue Book Table 1 and attached tables

(b) proposed PWQG's are under development for 2,3,7,8-T4CDD and 2,3,7,8-T4CDF only

(c) proposed PWQG's are available for some isomers of dimethylphenol

(d) PWQO is for MONOCHLOROPHENOL (7 μg/L)

(f) PWQO is for DIETHYLHEXYLPHTHALATE (0.6 μg/L)

(g) PWQO is for DIBUTYLPHTHALATE (4.0 μg/L)

(h) PWQO is for OTHER PHTHALATES (0.2 μg/L)

(j) PWQO/G is available for total PCB's, for total resin acids and for DHA, but not other individual isomers

PWQG = Provincial Water Quality Guideline

PWQO = Provincial Water Quality Objective

SUMMARY OF AVAILABLE PWQO/G – JULY 1992

PARAMETER	PROVINCIAL WATER QUALITY GUIDELINE
ALUMINUM, INORGANIC MONOMERIC	0.015 mg/L, at pH 4.5 to 5.5 measured in clay-free samples
ALUMINUM, ACID SOLUBLE INORGANIC	<10% increase above avge. background at pH>5.5-6.5 in clay free samples
ALUMINUM, TOTAL	0.075 mg/L at pH 6.5-9.0 measured in clay free samples
DHA	see footnote 1
RESIN ACIDS, TOTAL	see footnote 1
PHOSPHORUS, TOTAL	To avoid nuisance algae concentrations in lakes, total P should not exceed 20 μg/L
	To protect against aesthetic deterioration in lakes, total P should not esceed10 μg/L
	To avoid excess plant growth in rivers & streams, total P should not exceed 30 μg/L

(1) Total resin acids and DHA are pH dependent as shown below:

Receiving water pH	DHA (μg/L)	Total Resin Acids (μg/L)
5	1	1.0
5.5	1.9	2.7
6	2.5	4.2
6.5	4.2	9.3
7	8	25.0
7.5	11.8	45.4
8	12.9	52.4
8.5	14	59.8
9	14.3	61.5

PROPOSED METAL PWQO/G		
SUBSTANCE	HARDNESS (mg/L)	PROPOSED PWQO/G (μg/L)
CADMIUM	0 – 100	0.15
	> 100	0.45
COPPER	0 – 20	1
	> 20	5
LEAD	0 –30	1
	30 –80	3
	> 80	5

APPENDIX E-3

Background on Data Confidence Limits

Appendix E-3

Background on Data Confidence Limits.

Summary:

In section III-A, page 7, a reference is made to uncertainty associated with analytical data. As with all experimentally determined quantities a level of uncertainty always exists. This uncertainty factor is usually expressed as probable range for a quantity with an associated confidence figure, for example 3.5 mg/L plus or minus 0.7 mg/L with 95% confidence. This range limits the extent of reasonable comparisons of data. A simple arithmetical procedure described below allows for estimation of this uncertainty for any of the data in this report.

General Outline:

It is usually reasonable to compare averages for parameters which are much larger than the RMDL and state, with confidence, that differences of 20% or more in concentration in one stream or another are "real" and represent quantitative differences in performance. However, for parameters where the mean concentrations are close to the RMDL, and/or where there is a relatively low frequency of monitoring, the confidence limits may be so broad that comparisons are not meaningful.

As an example of an invalid comparison consider a parameter which was measured monthly for a one year period at each of two plants. Let us say at the first plant the mean concentration for the parameter was 0.6 times the RMDL and at the second plant, 0.2 times the RMDL. An estimation of confidence limits shows these two figures are in fact indistinguishable despite the fact that one figure is three times larger than the other. This is expressed by stating that their confidence ranges overlap and that it is not possible to say either plant has better performance.

The process of establishing the size of the confidence range associated with data involves a consideration of method detection limit (MDL) values and a knowledge of the approximate number of sample measurements used to calculate the mean value for a parameter concentration. RMDL values quoted in this report may be taken to be the MDLs and effluent analysis frequencies are listed in schedules in the monitoring regulation for the IC Sector. Where confidence ranges for intake streams are of interest the intake measurement frequency is needed. The attached table E-1 provides these frequencies and also indicates the large and entirely voluntary effort made by many of the plants to provide soundly based intake data.

The method of measurement of laboratory detection limits (laboratory MDLs) is based on simple statistical technique (Estimation of Analytical Method Detection Limits - ISBN-0-7729-4117-3). This method sets the RMDL concentration numerically equal to three standard deviations based on experiments using repeated measurements on a dilute solution of a contaminant.

It follows from the above derivation of MDL, that the usual statistical treatment which is

based on the "normal" distribution, can be used. These statistical methods allow for natural data scatter and lead to the following reasoning. Each individual analytical reading measurement made on a solution provides an estimated value for the actual concentration. Also associated with this reading is a range dependent on the "noise" level of the method used. With 95% confidence the range is defined to be from two standard deviations above to two below the reading. In this case for a solution at RMDL concentration the range is from 0.33 to 1.67 times the RMDL, {(1.0 - 0.67)RMDLs to (1.0 + 0.67)RMDL}. This same confidence range can also be expressed as a percentage ie. ± 67%.)

At concentrations which differ from the RMDL value it may be assumed that the "noise" level due to the analytical method remains constant. For example at a concentration of 5 times RMDL level the 95% confidence interval will be from 5 RMDL less 0.67 RMDL to 5 RMDL plus 0.67 RMDL. This statistical argument forces the conclusion that at average concentrations near five times the RMDL, differences of less than about 1.4 times the RMDL in plant to plant comparisons are not interpretable as actual differences. This analysis holds wherever only single analytical measurements of each stream are available.

Where many analytical results are used to provide average concentrations the standard deviation becomes smaller and the confidence interval diminishes allowing for "finer" comparisons. This rate of diminishing is inversely proportional to the square root of the number of readings being averaged. For monthly readings averaged over a year, the confidence intervals would be root 1/12 or about 0.29 times the range associated with a single measurement. The corresponding reductions are 0.14 for averages based on weekly readings and 0.05 for averages where the parameter was measured daily.

The following is an example of the confidence limit calculation where averages concentrations are about twice the RMDL concentration and where analyses were reported monthly:
At 95% confidence the interval will be 0.7 of the RMDL divided by the square root of 12. The confidence limits work out from this as 2 ± 0.193. More conveniently we can convert to a percentage - approximately ± 10%.
This means that for any parameter having a mean concentration around 2 RMDL level and which has been measured at monthly frequency, mean concentration values which differ by less than 20% are not safely interpretable as representing actual differences.

Here is another example, which illustrates the point using selected intake and effluent data. Mercury analyses at a plant were made on a weekly basis on both intake and effluent streams. At 95% confidence, the confidence interval is approximately 0.7 RMDL/root 52 or about 0.1 RMDL. This means that concentration mean values must be separated by at least 0.2 times the RMDL concentration before they can be ranked as larger and smaller. The mean intake and effluent concentrations were 0.099 and 0.126 ug/L and the RMDL is 0.1 ug/L. These mean values are just outside the confidence range of 0.2 times RMDL. It may be inferred from this that plant activities are very probably responsible for the apparent mercury concentration increase.

Continuing with this "mercury" example it is possible now to estimate a range of values for the mercury loading due to the plant operations. (This necessarily is a range with

minimum and maximum values and an associated confidence figure and not the figure that results from subtraction of the average concentrations.) The maximum possible will be given by finding the difference between the highest value from the effluent concentration range and the lowest value from the intake concentration range:

$$\{(0.126 + 0.01) - (0.099 - 0.01)\} = 0.047 \text{ ug/L}$$

The corresponding minimum will be given by the smallest likely difference between the two concentration ranges which works out at 0.007 ug/L.

The loading could now be calculated from this minimum and maximum using the flow reported. However, in this example the very large (seven fold) range of possible concentrations indicates the loading is not quantifiable with any reasonable level of confidence (except in the sense that a "less than" figure can be calculated).

Conclusions:

Analysis of data using RMDL based confidence limits can demonstrate the existence of the following situations:

1- Where concentration averages are too low for reasonably precise loadings to be calculated.

2- Where concentration differences between intake and effluent are not reasonably interpretable as results of plant activities.

3- Where concentration differences indicate reasonable evidence for contribution of a parameter to effluent due to plant activity but where the loading differential is too small relative to confidence intervals for quantification to be possible.

4- Where concentration differences and loading differences between effluent and intake are reasonably soundly based from the evidence available from analytical factors alone.

It is important to be aware that regular changes in plant operating condition can sometimes produce much greater effluent variability than the confidence ranges calculated as shown above. Cases where this is so can be detected from the 99'th percentile values listed in appendix D; these percentile values are placed at approximately three standard deviations over the long term concentration means from statistical calculations using all the reported data.

Table E – 1 Intake Water Parameters – Monitoring Frequencies

ATG	/PARAMETER	Plant Code (For legend see page 3)																
		ALW	ALL	CYN	CYW	GEN	ICa	ICb	ICc	LCC	LCM	NIT	NOR	PUR	S*UL	WEM	WMI	WEL
c	Total suspended solids	365	12	360	54	365	10	5	10	4	6	2	345	3		46	223	
c	Volatile suspended solids	1	5	2	2			3				1	2	1				
c	Hydrogen ion (pH)	365	12	52	54	365	10	6	10			2	33	3		45	224	
c	Specific conductance	365	12	7	54	365	10	6	10			2	38	3		45	223	
c	DOC	52	8	48	2	52	9	8	9	4	5	2	50	3		11		
c	TOC	52	11	28	2	52	1	8		4	5		16	3				
c	COD	2		2	2	2	2	4	2			2	2					
c	Oil and grease	52	12	48	54	52	11	5	11	3	5	2	50	2		11		1
c	Ammonia plus Ammonium	12	12	11	54	52	11	6	11			2	50	3				
c	Nitrate+Nitrite	12	12	13	54	52	6	6	6			2	49	3				
c	Total Kjeldahl nitrogen	12	11	11	54	52	11	6	11			2	50	3				
c	Total phosphorus	365	1	48	54	52	11	5	11	5	5	2	47	3				1
09	Silver	12	12	11	2	12	11	8	11	5	5	2	11		2	11		1
	Aluminum	52	12	11	2	12	11	8	11	5	5	2	144		2	11		1
	Boron	17	12	11	2	12		8		5	5	2	11		2	11		1
	Beryllium	12	12	11	2	12	10	8	10	5	5	2	11		2	11		1
	Cadmium	12	12	11	2	12	11	8	11	5	5	2	11		2	11		1
	Cobalt	12	12	11	2	12	11	8	11	5	5	2	11		2	11		1
	Chromium	12	12	11	2	12	11	8	11	5	5	2	50		2	11		1
	Copper	12	12	11	2	12	11	8	11	5	5	2	49		2	11		1
	Molybdenum	12	12	11	2	12	10	8	10	5	5	2	50		2	11		1
	Nickel	12	12	11	2	12	11	8	11	5	5	2	11		2	11		1
	Lead	12	12	11	2	12	11	8	11	5	5	2	11		2	11		1
	Strontium	18	12	11	2	12		8		5	5	2	11		2	11		1
	Thallium	12	12	11	2	12	11	8	11	5	5	2	49		2	11		1
	Vanadium	12	12	11	2	12	2	8	2	5	5	2	11		2	11		1
	Zinc	12	12	11	2	12	11	8	11	5	5	2	50		2	11		1
10	Arsenic	2		11	2	11	11	7	11			2	2		2			1
	Antimony	2		11	2	11	11	7	11			2	2		2			1
	Selenium	2		11	2	11	11	7	11			2	2		2			1
11	Chromium (hexavalent)	7			2	45				5	5							
12	Mercury	52	12	11	2	52	11	4	11			2	49					1
14	Phenolics (4AAP)	12	12	11	2	52	10	9	10			2	2			11		1
15	Sulphide	2		2	2	52	10	4	11			2	1					
16	1,1,2,2–Tetrachloroethane	2		2	2	12	12	3	12			2	1					1
	1,1,2–Trichloroethane	2		2	2	12	12	3	12			2	1					1
	1,1–Dichloroethane	2		2	2	12	12	3	12			2	1					1
	1,1–Dichloroethylene	2		2	2	12	12	3	12			2	1					1
	1,2–Dichloroethane	2		2	2	12	12	3	12			2	1					1
	1,2–Dichloropropane	2		2	2	12	12	3	12			2	1					1
	Cis–1,3–Dichloropropylene	2		2	2	12	12	3	12			2	1					1
	Trans–1,3–Dichloropropylene	2		2	2	12	12	3	12			2	1					1
	Bromoform	2		2	2	12	12	3	12			2	1					1
	Dibromochloromethane	2		2	2	12	12	3	12			2	1					1
	Chloromethane	2		2	2	12	12	3	12			2	1					1
	Chloroform	2		2	2	12	12	3	12			2	1					1
	Carbon tetrachloride	2		2	2	12	12	3	12			2	1					1
	Methylene chloride	2	11	2	2	12	12	3	12			2	1					1
	Trans–1,2–Dichloroethylene	2		2	2	12	12	3	12			2	1					1
	Trichlorofluoromethane	2		2	2	12	12	3	12			2	1					1
	Tetrachloroethylene	2		2	2	12	12	3	12			2	1					1
	Trichloroethylene	2		2	2	12	12	3	12			2	1					1
	Vinyl chloride	2		2	2	12	12	3	12			2	1					1
	1,2–Dichlorobenzene	2		2	2	12	12	3	12			2	1					1
	1,3–Dichlorobenzene	2		2	2	12	12	3	12			2	1					1

Table E – 1 Intake Water Parameters – Monitoring Frequencies

ATG	PARAMETER	Plant Code																
		ALW	ALL	CYN	CYW	GEN	ICa	ICb	ICc	LCC	LCM	NIT	NOR	PUR	S* UL	WEM	WMI	WEL
16	1,4–Dichlorobenzene	2		2	2	12	12	3	12			2	1					1
	Chlorobenzene	2		2	2	12	12	3	12			2	1					1
	Ethylene dibromide	2		2	2	12	12	3	12			2	1					1
	Bromomethane	2		2	2	12	12	3	12			2	1					1
17	Styrene	2		2	2	2	12	3	12			2	1					1
	Benzene	2		2	2	2	12	3	12			2	1					1
	m–Xylene and p–Xylene	2		2	2	2	12	3	12			2	1					1
	o–Xylene	2		2	2	2	12	3	12			2	1					1
	Toluene	2		2	2	2	12	3	12			2	1					1
18	Acrolein	2		2	2	2		3				2	1					
	Acrylonitrile	2		2	2	2		3				2	1					
19	Diphenylamine	2		6	2	2		3				2	1					
	2,4–Dinitrotoluene	2		6	2	2		3				2	1					
	2,6–Dinitrotoluene	2		6	2	2		3				2	1					
	4–Bromophenyl phenyl ether	2		6	2	2		3				2	1					
	4–Chlorophenyl phenyl ether	2		6	2	2		3				2	1					
	Bis(2–chloroethyl)ether	2		6	2	2		3				2	1					
	Bis(2–chloroethoxy)methane	2		6	2	2		3				2	1					
	Bis(2–chloroisopropyl)ether	2		6	2	2		3				2	1					
	Benzylbutylphthalate	2		6	2	2		3				2	1					
	Bis(2–ethylhexyl) phthalate	2		6	2	2		3				2	1					
	Camphene	2		11	2	2		3				2	1					
	Di–n–butyl phthalate	2		6	2	2		3				2	1					
	Diphenyl ether	2		6	2	2		3				2	1					
	N–Nitrosodiphenylamine	1		6	2	2		3				2	1					
	N–Nitrosodi–n–propylamine	2		6	2	2		3				2	1					
	1–Chloronaphthalene	2		11	2	2		3				2	1					
	1–Methylnaphthalene	2		11	2	2		3				2	1					
	2–Chloronaphthalene	2		11	2	2		3				2	1					
	2–Methylnaphthalene	2		11	2	2		3				2	1					
	5–nitro, Acenaphthene	2		11	2	2		3				2	1					
	Acenaphthene	2		11	2	2		3				2	1					
	Acenaphthylene	2		11	2	2		3				2	1					
	Anthracene	2		11	2	2		3				2	1					
	Benz(a)anthracene	2		11	2	2		3				2	1					
	Benzo(a)pyrene	2		11	2	2		3				2	1					
	Benzo(b)fluoranthene	2		11	2	2		3				2	1					
	Biphenyl	2		11	2	2		3				2	1					
	Benzo(k)fluoranthene	2		11	2	2		3				2	1					
	Chrysene	2		11	2	2		3				2	1					
	Dibenz(a,h)anthracene	2		11	2	2		3				2	1					
	Fluoranthene	2		11	2	2		3				2	1					
	Fluorene	2		11	2	2		3				2	1					
	Benzo(g,h,i)perylene	2		11	2	2		3				2	1					
	Indole	2		11	2	2		3				2	1					
	Indeno(1,2,3–cd)pyrene	2		11	2	2		3				2	1					
	Naphthalene	2		11	2	2		3				2	1					
	Perylene	2		11	2	2		3				2	1					
	Phenanthrene	2		11	2	2		3				2	1					
	Pyrene	2		11	2	2		3				2	1					
20	2,4–Dichlorophenol	2		2	2	2		3				2	1					
	2,4–Dimethylphenol	2		2	2	2		3				2	1					
	2,4–Dinitrophenol	2		2	2	2		3				2	1					
	2,6–Dichlorophenol	2		2	2	2		3				2	1					
	4,6–Dinitro–o–cresol	2		2	2	2		3				2	1					
	4–Nitrophenol	2		2	2	2		3				2	1					
	m–Cresol	2		2	2	2		3				2	1					
	o–Cresol	2		2	2	2		3				2	1					

Table E – 1 Intake Water Parameters – Monitoring Frequencies

ATG	/PARAMETER	Plant Code ALW	ALL	CYN	CYW	GEN	ICa	ICb	ICc	LCC	LCM	NIT	NOR	PUR	SUL	WEM	WMI	WEL
	Phenol	2		2	2	2		3				2	1					
	2–Chlorophenol	2		2	2	2		3				2	1					
	2,3,4–Trichlorophenol	2		2	2	2		3				2	1					
	2,3,4,5–Tetrachlorophenol	2		2	2	2		3				2	1					
	2,3,4,6–Tetrachlorophenol	2		2	2	2		3				2	1					
	2,3,5–Trichlorophenol	2		2	2	2		3				2	1					
	2,3,5,6–Tetrachlorophenol	2		2	2	2		3				2	1					
	2,4,5–Trichlorophenol	2		2	2	2		3				2	1					
	2,4,6–Trichlorophenol	2		2	2	2		3				2	1					
	4–Chloro–3–methylphenol	2		2	2	2		3				2	1					
	Pentachlorophenol	2		2	2	2		3				2	1					
23	Hexachlorobutadiene	2		2	2	2	12	3	12			2	1					1
	Hexachlorocyclopentadiene	2		2	2	2	12	3	12			2	1					1
	1,2,3–Trichlorobenzene	2		2	2	2	12	3	12			2	1					1
	1,2,3,4–Tetrachlorobenzene	2		2	2	2	12	3	12			2	1					1
	1,2,3,5–Tetrachlorobenzene	2		2	2	2	12	3	12			2	1					1
	1,2,4–Trichlorobenzene	2		2	2	2	12	3	12			2	1					1
	1,2,4,5–Tetrachlorobenzene	2		2	2	2	12	3	12			2	1					1
	Hexachlorobenzene	2		2	2	2	12	3	12			2	1					1
	Hexachloroethane	2		2	2	2	12	3	12			2	1					1
	Octachlorostyrene	2		2	2	2	12	3	12			2	1					1
	Pentachlorobenzene	2		2	2	2	12	3	12			2	1					1
	2,4,5–Trichlorotoluene	2		2	2	2	12	3	12			2	1					1
24	2,3,7,8 TCDD	2		2	2	2		2				2	1					
	Total TCDD	2		2	2	2		2				2	1					
	Total TCDF	2		2	2	2		2				2	1					
	Total PCDD	2		2	2	2		2				2	1					
	Total PCDF	2		2	2	2		2				2	1					
	Total H6CDD	2		2	2	2		2				2	1					
	Total H6CDF	2		2	2	2		2				2	1					
	Total H7CDD	2		2	2	2		2				2	1					
	Total H7CDF	2		2	2	2		2				2	1					
	Octachlorodibenzo–p–dioxin	2		2	2	2		2				2	1					
	Octachlorodibenzofuran	2		2	2	2		2				2	1					
25	Cyanide Total	2		3	47	52		3				2	2					
27	PCBT	2		2	2	2		3				2	1					1
I1	Chloride	2	7	2	2	156	8	4	8			2	2				11	
I2	Fluoride	2	7	2	2	156		5				2	2				1	
I3	Sulphate	2		2	2	156	8	5	8			2	139				10	

Notes:

Data for Sulco intake is one result each for two sources on ATG 9 parameters only.

Plant Code Legend

Albright and Wilson	ALW	Liq. Carb. Courtr.	LCC
Allied Chemicals	ALL	Liq. Carb. Maitl.	LCM
Cyanamid Niagara	CYN	Nitrochem	NIT
Cyanamid Welland	CYW	Norton	NOR
General Chemical	GEN	Puritan Bennett	PUR
ICI Cornwall	ICa	Sulco	SUL
ICI Courtright	ICb	Wash. Electro Min.	WEM
ICI Conpac	ICc	Washington Mills	WMI
		Welland Chemical	WEL

APPENDIX E-4

Glossary of Selected Terms

Glossary of Selected Terms

Ammonia plus Ammonium (Total ammonia) is a measure of ionized and un-ionized ammonia. The amount of un-ionized ammonia depends upon pH and temperature; concentrations of un-ionized ammonia above 0.02 mg/L are toxic to fish.

Bioaccumulative Toxic Substance is a substance with a Bioconcentration Factor (BCF) greater than 1000 or an octanol-water partition coefficient (log K) greater than 4.

Chemical Oxygen Demand (COD) is a measure of the total oxygen to degrade organic and inorganic material by chemical oxidation.

Dissolved Organic Carbon (DOC) is a measure of the total dissolved organic material.

Oil and Grease (Solvent Extractables) is a measure of dissolved hydrocarbons, oils, greases, surfactants, etc., which may be visible as a sheen on the water surface. This test yields variable data depending on sampling procedures, the solvent used for extraction and the types of hydrocarbons present in the sample.

pH is a measure of hydrogen concentration on a logarithmic scale of 0 (acidic) to 14 (basic). Surface waters generally have a pH of 6 to 7.

Persistent Toxic Substance is a substance that has a half-life in water equal to or greater than 56 days.

Phenolics (4AAP) is the result of the total phenolics by the 4-amino antipyrine test.

Provincial Water Quality Objective (PWQO) is a numerical or narrative criteria recommended to protect all forms of aquatic life during indefinite exposure and to protect recreational water uses.

Provincial Water Quality Guideline (PWQG) represents the best available criteria when there is not enough information to meet the minimum requirements for setting a PWQO.

Total Kjeldahl Nitrogen (TKN) is a measure of both organic nitrogen and total ammonia.

Total Organic Carbon (TOC) is a measure of the total organic material.

99'th percentile concentration value is defined such that, if the concentration values are arranged in ascending order, 99% of them would fall below while only 1% would exceed that specific concentration value. It is calculated from statistical formulae that are selected for normal, log-normal and non-parametric distributions of the data.

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